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DISEASES CAUSED BY BACTERIA AND FUNGI.

MÖLLMANN, L. H. (1933). Variabilität der Streptokokken und ihre praktische Bedeutung für die Herstellung von Impstoffen. [**Variation amongst Streptococci and its Significance in the Preparation of Vaccines**].—*Tierärztl. Rdsch.* **39.** 539-542, 558-563 and 576-578. 5 figs., 3 tables. [32 refs.]

The author examined 11 strains of streptococci obtained from the nose, bronchi or bronchial glands of thoroughbreds affected with Hoppegarten cough.

From 8 out of the 11 he obtained S and R forms and a series of intermediate O forms, whose characters and behaviour towards various fermentable substances, resistance to dyes and ultra-violet light, pathogenicity and protective powers are described.

It is concluded that the choice of one or other form for the preparation of vaccines is of no significance. [Hoppegarten cough is caused by a virus: see WALDMANN, KÖBE & PAPEO. (1934). *Berl. tierärztl. Wschr.* **50.** 1].

—A. W. STABLEFORTH.

BRYAN, C. S. (1933). **Studies on Vaccines in Infectious Mastitis.**—*J. Amer. Vet. Med. Ass.* **83.** 390-399. 2 figs., 5 tables. [6 refs.]

From the regular and notable decrease in the number of affected quarters which followed weekly subcutaneous injection of killed or living autogenous vaccines or of a lacto-vaccine, it is concluded that these are of value in the prevention and cure of infectious streptococcus mastitis in bovines. The results were assessed by clinical examination and a laboratory examination of the milk of each quarter including a cultural test in blood agar plates. No controls could be kept.

The results obtained in four herds picked at random from those treated with autogenous vaccine are given. Two herds of six and eleven cows were given killed cultures weekly for five and seven weeks respectively. In the first herd the number of infected quarters fell from four to one, and in the second they fell from 13 to four.

Two herds were given living cultures. In one herd of 40 cows the infected quarters detected at the weekly laboratory examination were as follows :—25, 19, 6, 7 and 6. In another of 21 cows they were 28, 26, 14 and 9 respectively.

The lacto-vaccine was made by adding a 1 per cent. solution of brilliant green to milk obtained from quarters injected with streptococci to give a 1 : 10,000 concentration of the dye, and allowing the dye to act for 30 minutes. Gentian violet is suggested as a good alternative. Details are given of one herd of 19 cows in which the disease was spreading rapidly. Two months before treatment five quarters of three cows were infected. At the time of commencing treatment 20

quarters of ten cows were infected. The figures of the seven successive weeks were :—20, 16, 16, 9, 3, 1 and 1.—A. W. STABLEFORTH.

HUBER, F. L. (1933). Over de waarde van glucoside-miltvuur entstoffen. **[Value of Glucoside Vaccine against Anthrax].**—*Ned.-Indisch. Blad. Diergeneesk.* **45.** 285-310. 8 tables. [6 refs.] [Summaries in English and German : abst. from orig.]

An extensive examination was made of the value of vaccination against anthrax with virulent bacilli mixed with a certain concentration of saponin-NaCl solution, as introduced by MAZZUCHI and worked out by HRUSKA. The saponin caused a local oedema and necrosis, through which the bacilli were unable to spread. A local immunity process was seen. A vaccine prepared with digitonin, instead of with saponin, proved to be better. The local as well as the general reaction varied in different animals ; the resulting immunity varied with different strains of bacteria.—A. KLARENBEEK (UTRECHT).

OPPERMANN, T., & DOENECKE, H. (1933). Beiträge zur Epidemiologie und Diagnose der Tuberkulose des Pferdes. **[Epidemiology and Diagnosis of Equine Tuberculosis].**—*Deuts. tierärztl. Wschr.* **41.** 641-646 and 659-662. 8 figs., 1 table. [50 refs.]

This article is unsuited to abstraction and readers are referred to the original, which describes detailed observations made upon 224 cases of equine tuberculosis at Hanover. The symptoms are discussed in detail and it is emphasized that these differed according to the site of extensive tuberculous changes. 63 per cent. of all cases showed pulmonary symptoms, but only 35 per cent. showed marked nasal discharge. 50 per cent. of all cases showed polyuria, but only one of these proved to have kidney lesions.

Factors in diagnosis are the tuberculin test, cultivation of the organism and an increase in the number of leucocytes. For the differential diagnosis, botriomycosis, glanders, diabetes, chronic indurative nephritis and infectious anaemia are mentioned. The significance of the " sublimate test " [BENNETT & KENNY (1928). *J. Comp. Path. & Therap.* **41.** 341, and OPPERMANN (1933). *Arch. wiss. prakt. Tierhlk.* **66.** 485] in the differentiation of tuberculosis and infectious anaemia is discussed.—E. J. PULLINGER.

I. FLÜCKIGER, G. (1933). Die bisherigen Vorarbeiten zur Bekämpfung der Rindertuberkulose. **[Preliminary Work on the Control of Bovine Tuberculosis].**—*Schweiz. Arch. Tierhlk.* **75.** 223-240. [2 refs.]

II. FRESDORF, E. (1933). Erfahrungen mit dem Tuberkulosetilgungsverfahren. **[Experiences under the Scheme for eradicating Tuberculosis].**—*Zschr. Infektkr. Haust.* **44.** 208-217. [4 refs.]

I. The Federal Department of Political Economy has addressed a circular to all Swiss cantonal governments, peasant associations, cattle-breeding societies and the Association of Swiss Veterinary Surgeons, in regard to the control of bovine tuberculosis, describing the work hitherto done and setting out draft regulations proposed to be incorporated in a federal law for the complete eradication of this disease. Flückiger in this article reviews the work done in Switzerland since 1886, describes the investigations made by a special commission appointed in 1926, sets out the government circular and the draft regulations, and explains in some detail the implications of the proposals. It is agreed that the eradication of tuberculosis in Switzerland can best be accomplished by a voluntary rather than by a compulsory scheme. The societies referred to were requested to examine carefully the pro-

posals and to send in their observations not later than the 15th June, 1933. The federal government undertakes to contribute 50 per cent. of the cantonal expenditure on eradication, provided that certain conditions are observed. The rules comprise instructions regarding notification, inspection, disinfection, etc. Animals with open tuberculosis are to be ear-marked and must not be moved to other farms. Animals ordered to be slaughtered must also be ear-marked and be slaughtered within 30 days and meat inspectors must immediately report the presence of tuberculous carcasses. Milk containing tubercle bacilli may only be used for feeding animals after it has been boiled.

After setting out the present monetary losses due to tuberculosis, Flückiger points out that the proposed scheme will be economically advantageous, and urges all parties to give their support to the scheme on the ground that in Switzerland the conditions for its success are better than in other countries.

II. From his experience both as assistant to a general practitioner and as veterinary officer, Fresdorf is of opinion that the clinical examination for tuberculosis cannot be so efficiently carried out by the private practitioner as by the veterinary officer, who, by continuous practice, acquires great skill. He attributes the numerous failures of the state-recognized voluntary scheme for the eradication of tuberculosis to the fact that it was systematically applied to all herds irrespective of their condition and that occasionally its execution, especially in regard to clinical examinations, was imperfect. The scheme will work, however, if the rules laid down by VON OSTERTAG are scrupulously observed and if, in addition, strict attention is paid to hygiene, proper feeding and avoidance of excessive productivity. The herds should be re-examined every six months.

It is of the utmost importance to secure the enlightened co-operation of the owner, on whom depends prompt notification and the carrying out of the fundamental rules that no new animals must be introduced into the herd except from tuberculosis-free stock and that all animals under the scheme be permanently ear-marked.—F. BULLOCK.

LANGKILDE, K. (1933). Iagttagelser fra Praksis over Tuberkulosens Udbredningsmaade hos Svinet. [**Practical Observations on the Method of Dissemination of Tuberculosis in Swine**].—*Maanedsskr. Dyrl.* **45.** 260-267. [1 ref.]

The author records observations made in the course of his meat inspection duty at a large bacon-curing factory, especially as regards the localization of tuberculosis in certain organs of the pig. The infection is chiefly intestinal. Certain localizations in lymphatic glands are indicative of retrograde lymphogenous infection. Thus the inferior cervical lymphatic glands should always be removed in cases of tuberculosis of the lungs. The liver is affected in 80 per cent. of tuberculous pigs. In the author's opinion, tuberculosis of the spleen occurs only in association with tuberculosis of the liver. A number of observations are given that are considered to indicate that the spleen is infected through a retrograde lymph stream from the hilus glands of the liver to the spleen.

—H. C. BENDIXEN (COPENHAGEN).

IWANOFF, K. (1933). Ueber Geflügeltuberkulose und ihre Verbreitung in Bulgarien. [**Avian Tuberculosis and its Incidence in Bulgaria**].—*Zschr. Infektkr. Haust.* **44.** 243-249. 1 table. [14 refs.]

The incidence of tuberculosis amongst fowls in Bulgaria is in general small. Of 4,287 birds tested by the intradermal method in the wattle, 0·66 per cent. were positive. An exception was found in the case of the state poultry breeding station

from which the positive reactors had already been removed on several occasions; of 701 birds, 15·4 per cent. reacted and 3·5 per cent. gave a doubtful result. Of the total tested, 27 were turkeys, all of which were negative.

The author believes that in lightly infected flocks the intradermal test, followed by the removal of positive reactors, is of great service, but that, in badly infected flocks, eradication by these methods is difficult or impossible.

—A. W. STABLEFORTH.

BIRKHAUG, K. E. (1933). Étude comparative des colonies dissociées des cultures de Bacilles tuberculeux aviaire, bovin et humain. [**The Dissociation of Colonies of Avian, Bovine and Human Types of Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **113.** 726-728.

The author has succeeded in dissociating six strains of the tubercle bacillus: three (one of each type) were fully virulent while the others were atypical. The formation of colonies of the S type was facilitated by inoculating the organisms into the cervical glands of guinea pigs [NINNI, this *Bull.* **2.** 197.] and withdrawing blood at intervals. The cultures were obtained by Löwenstein's method. In this way, S types were produced in adequate numbers, 2 c.c. of blood yielding from 1 to 258 colonies. Each strain examined dissociated into three distinct S variants, which are described, and also an R form. The S types were less acid-fast than the R variant; moreover the former were facultative anaerobes while the latter was strictly aerobic.—R. E. GLOVER.

VALTIS, J., & VAN DEINSE, F. (1933). Sur les variations des caractères de culture des bacilles issus des éléments filtrables du virus tuberculeux. [**Variations in the Cultural Character of the Bacilli Yielded by the Filtrable Elements of the Tuberculous Virus**].—*Ann. Inst. Pasteur.* **51.** 419-427. [Copied *verbatim* from *Bull. Hyg.* **9.** 208. Signed by C. LILLINGSTON].

This study is a continuation of a series published, for the most part in connexion with L. NÈGRE, on the results of successive passages of a tuberculous virus through guineapigs. It was found that when filtrates of cultures or of crushed tuberculous organs were injected under the skin or into the peritoneal cavity, successive re-inoculations yielded, in some cases, two types of lesions. In the one, known as the Calmette-Valtis type, there were no tubercles. In the other, the classical type Villemin, there were more or less generalized tuberculous lesions. The researches which Valtis and Van Deinse have conducted for more than two years in this field have convinced them that, under the above conditions, two different strains of bacillus may be found together in variable proportions, a smooth strain S and a rough strain R which can be separated the one from the other, either by cultivation on appropriate solid media, or by passage through animals which are more susceptible to one strain than to the other. With filtrable elements from an originally bovine strain it is possible, according to the choice of animal, to ensure, by successive passages, the evolution of a mammalian type with the R strain predominant, or that of an avian type, with the S strain predominant. If this view is correct, support will be found for Calmette's theory that the filtrable elements represent the true virus of tuberculosis, and that it is one and the same for all warm-blooded animals liable to contract tuberculosis. The old view which distinguishes three absolutely different types of tubercle bacillus may prove to be mistaken if it be established that one and the same virus is responsible for strains of bacilli which became differentiated in the process of adaptation to different animal hosts.

CAMPANA, R. (1933). I granuli di Schrön-Mircoli-Much nella tubercolosi bovina. [**Schrön-Mircoli-Much Granules in** *Mycobacterium tuberculosis* **from Bovine Lesions**].—*Clin. Vet. Milan.* **56.** 681-696. 1 table. [39 refs.]

Research work was carried out on 32 cases of tuberculosis representing the most common forms occurring in bovines. The object of the work was to demonstrate the occurrence of the granules which were pointed out by SCHRÖN in 1886, described in 1900 by MIRCOLI and in 1907 by MUCH.

In 21 out of 32 cases it was possible to detect typical tubercle bacilli as described by KOCH and in 13 out of the 21 cases the bacilli showed the presence of SCHRÖN-MIRCOLI-MUCH granules.

Both MUCH granules and KOCH tubercle bacilli were found more frequently in the tuberculous forms which were considered to be at the most acute stage of infectivity and the most dangerous.

The detection of the MUCH granules was based upon microscopic examination of tuberculous material obtained from bovines slaughtered at the public abattoir, and the method of staining generally preferred was that of Fontes.

—F. VEGLIA (TURIN).

MINETT, F. C. (1933). **Johne's Disease, including Johne's Disease in Sheep.**—*Vet. Rec.* **13.** 1074-1091. 1 table. [22 refs.]

This report to the 1933 Annual Congress of the National Veterinary Medical Association consists of a review of Johne's disease in cattle under the following headings :—prevalence and economic importance, symptoms and course of the disease, diagnosis during life and after death, differential diagnosis and prevention. The points raised cannot be dealt with adequately in an abstract. Figures are given to show the incidence of the disease in seven herds as revealed by testing with johnin. Special consideration is devoted to the use of this reagent for diagnosis and to the steps which may be taken to reduce losses in infected herds.

Records from the literature on the disease in sheep are summarized.

—F. C. MINETT.

I. BÜHLMANN, J. (1933). Durch B. pyogenes bovis hervorgerufene ansteckende Metritis und Vaginitis bei Kühen. [**Metritis and Vaginitis of Cows caused by** *Corynebact. pyogenes*].—*Schweiz. Arch. Tierhlk.* **75.** 312-314.

II. WITTE, J. (1933). Beitrag zur Infektion der Fohlen mit dem Corynebacterium pyogenes equi. [*Corynebact. pyogenes* **Infection in Foals**].—*Deuts. tierärztl. Wschr.* **41.** 657-659. [4 refs.]

III. HIRATO, K. (1933). **Studies on** *Corynebacterium renalis* (*Bacillus renalis bovis* **Bollinger**) I.—*J. Jap. Soc. Vet. Sci.* **12.** 264-289. 10 figs. on 3 plates, 8 tables, 1 chart. [7 refs.] [Orig. in Japanese : abst. from author's English summary].

I. The symptoms shown by three cows suffering from metritis and vaginitis, following calving, are described. *C. pyogenes* was isolated from the uterine secretion and, in one case, at autopsy.

II. A description is given of a disease of suckling foals encountered in two large breeding studs. The symptoms commenced with a purulent nasal discharge and bronchitis, the temperature ranging around 39°C. ; general symptoms were not marked. As the condition progressed the lungs became involved and, with the onset of pneumonia, general symptoms became pronounced. *C. pyogenes* was isolated from infective foals and was considered to be the causal agent. Further investigation on this point is, however, necessary. Treatment with specific vaccine was not helpful.

III. Fourteen strains of *C. pyogenes* were isolated from cases of pyelonephritis and urocystitis of cattle. These, together with two American strains and eight strains of diphtheroid organisms obtained from the urine of normal cattle, were classified into three groups according to their growth in common media, heat-resistance and dye sensitivity.—E. J. PULLINGER.

I. TIEDGE, F. L. (1932). Ueber Rotlaufinfektionen bei Schaflämmern. **[Swine Erysipelas Infection in Lambs]**.—*Deuts. tierärztl. Wschr.* **40.** 793-796. 2 figs. [16 refs.]

II. KÖSER. (1932). Gelenkveränderungen bei Lämmern infolge Infektion mit Rotlaufbakterien. **[Changes in Joints of Lambs due to Swine Erysipelas Infection]**.—*Ibid.* 796-798. 2 figs. [17 refs.]

I. According to the author both acute and chronic swine erysipelas infection occurs in lambs. Acute infection affects the internal organs and chronic infection the joints, chiefly the elbow, knee, fetlock and hock joints. Bacterial cultures taken from a sheep usually differ from the porcine type of *Erysipelothrix rhusiopathiae.* Sheep strains do not grow on potato and they form different types of cultures on gelatine. Sheep cultures are, however, agglutinated by swine antiserum. An attempt to cure the infection in sheep with anti-swine erysipelas serum was not successful.

II. The author describes swine erysipelas infection in new-born lambs, which is usually characterized at the age of four to six weeks by lameness from arthritis ; permanent deformity usually results. Apart from various stages of arthritis, no characteristic changes in the internal organs are found at *post-mortem* examination.

In long-standing cases, cultural tests from joints are often negative, but newly affected joints usually contain Gram-positive bacteria resembling *E. rhusiopathiae.* Pin-point transparent colonies appear after 10 to 12 days on agar.

—E. BREUSCH (LEIPZIG).

LOBEL, L. W. M. (1933). Biologische mitigatie van malleusbacillen op rundergal-houdende voedingsbodems. I. Inleiding. Infectieproeven bij cavia's (eerste serie). **[Modification of *Pfeifferella mallei* on Ox Bile Medium]**.—*Ned.-Indisch. Blad. Diergeneesk.* **45.** 340-365. 3 tables. [2 refs.] [Summaries in English and German : abst. from German summary].

The author was able to reduce the virulence of *Pf. mallei* by cultivation on medium containing ox bile and, after a period of four and a half to five years of such cultivation, the organism was nearly non-virulent when tested on guinea pigs by intraperitoneal infection. The author considers this attenuation of *Pf. mallei* to be favourable for an attempt to produce a standard vaccine against glanders by this method.—J. E.

I. CHAILLOT, & MILLISHER. (1933). La séro-réaction de Vernes, son application au diagnostic de la morve. **[Use of Vernes' Sero-Reaction in Glanders]**. —*Rev. Path. comp.* **33.** 837-841. [5 refs.]

II. BELLER, K. (1933). Ein weiterer Beitrag zur quantitativen Wertbestimmung des Malleins. **[The Standardization of Mallein]**.—*Zschr. Infektkr. Haust.* **44.** 261-280. 6 tables. [10 refs.]

I. This is an adaptation of the sero-reaction of Vernes for the diagnosis of syphilis. To 0·8 c.c. of serum from the suspected horse is added 0·4 c.c. of a 3·5 per cent. solution of resorcine in distilled water. The density of the mixture is then calculated photometrically and, after standing for four hours at 20°C.,

the density is recalculated. The difference between these two readings gives the information required. In normal horses the differences in density were 7 to 24 photometric degrees, while in 14 glandered horses the differences were 95 to 249 degrees.

II. The principle underlying the standardization of mallein consists of ascertaining the ability of the preparation to fix complement in the presence of some suitable antiserum. The author finds that rabbit anti-mallein serum is not satisfactory for this purpose owing to the marked lability of the serum colloids. Serum from a glandered horse or anti-mallein horse serum gives better results.

—E. J. PULLINGER.

BANG, O. (1933). Bekaempelsen af den smitsomme kastning, fremkaldt af Brucella abortus Bang, hos kvaeget. [**Control of Contagious Abortion in Cattle caused by** *Brucella abortus* **Bang**].—*4 Nord. Vet.-mötet. Helsingfors.* pp. 22. [Summary in German : abst. from orig.]

It is stated that as herds that are completely free from abortion do not possess any immunity, complete eradication of contagious abortion is the idea method, provided that it is possible to prevent new infections. The author discusses vaccination with live culture and says that, as a rule, when properly employed, the number of cases of abortion is reduced considerably and that in small herds it may possibly lead to more rapid disappearance of the infection. In large herds it prevents the frequent appearance of periodic " flaring-up " of abortion.

He maintains that there are no grounds for the belief that the treatment increases udder infection with *Br. abortus* and that it is not true that the vaccination of heifers diminishes milk secretion ; he quotes as an example the milk supply in a large herd where the heifers have been vaccinated for a number of years. He is of the opinion that the frequency of infected udders after vaccination depends upon the virulence of the culture used for vaccine. A cow with an infected udder is very resistant to new infection of the uterus.

The author emphasizes the desirability of carrying out further tests on the vaccination of calves, as he maintains that the chances of setting up udder infection would then be slight.

Natural infection through the skin is of practicali mportance, besides infection *per os*.—L. SLAGSVOLD (OSLO).

THOMSEN, A. (1933). Beitrag zur Klassifizierung von Brucella-kulturen. (Vorläufige Mitteilung). [**Differentiation of Brucella Types**].—*Zlb. Bakt. I. (Orig.).* **130.** 257-259. 2 figs. [Copied *verbatim* from *Bull. Hyg.* **9.** 212. Signed by G. S. WILSON].

Differences are described in the growth of various types of *Brucella* in broth. The medium, made up with ox flesh extract, 1 per cent. Witte peptone, 0·5 per cent. sodium chloride, 0·25 per cent. dextrose, and standardized to pH 7·44, is distributed into 200 gram flasks. Under these conditions both the Danish and the American porcine *abortus* types give rise in 1–3 weeks to a mealy or scaly surface membrane and a heavy deposit that is difficult to disintegrate on shaking. Bovine abortus strains accustomed to grow aerobically give rise to a diffuse turbidity, a bluish-white ring growth, and a very slight deposit, which is easily disintegrated by shaking ; no true surface pellicle is formed. Bovine *abortus* strains requiring extra CO_2 when grown in an atmosphere containing 5 per cent. of this gas, behave like porcine strains grown aerobically. *Melitensis* strains give rise to a fairly dense turbidity, a moderately heavy deposit, and a granular, usually incomplete, surface growth, being intermediate in fact between the aerobic bovine and porcine strains.

VIGNOLI, L., & SCHAFER, E. (1933). Sur la parenté bactériologique des différents types des Brucellas. [**The Bacteriological Relationship of Different Types of Brucella**].—*Arch. Méd. Gén. et Colon.* **2.** 257-275. 1 fig. [60 refs.] [Copied *verbatim* from *Bull. Hyg.* **9.** 212. Signed by G. S. WILSON].

The authors, after reviewing the results of various workers who have examined *Brucella* strains by different methods, discuss the classification of this group of organisms. They conclude that though there are two main types—*abortus* and *melitensis*—each of these is so subject to variation under different environmental conditions that no hard-and-fast line of demarcation can be laid down between them. In a diagram they represent the various transitions from one to the other in relation to the species of host infected.

I. RINJARD, P. (1933). La Brucellose. [**Brucellosis**].—*Rec. Méd. vét.* **109.** 681-705.

II. LISBONNE, M., & VIDAL, L. F. (1933). La fièvre ondulante d'origine bovine en France. [**Undulant Fever of Bovine Origin in France**].—*1er Congrès internat. Hyg. méditerranéenne. 1932.* **1.** 645-653. [10 refs.]

III. BALOZET, L., & REYNAL, J. (1933). La fièvre ondulante d'origine bovine à Tunis. (*Note préliminaire*). [**Undulant Fever of Bovine Origin in Tunis. Preliminary Note**].—*Ibid.* 654-656.

IV. GRENOILLEAU. (1933). Un cas de fièvre ondulante à Brucella abortus d'origine bovine en Loir-et-Cher. [**A Case of Undulant Fever of Bovine Origin in Loir-et-Cher**].—*Ibid.* 681-685.

I. A comprehensive survey of the brucella group.

II. The authors survey briefly the present position in France regarding undulant fever. About two-thirds of the authentic cases of undulant fever of bovine origin are caused by *Br. melitensis* and not by *Br. abortus*.

III. Undulant fever was first recognized in Tunis in 1905, where it was introduced by goats imported from Malta. An inquiry is now in progress to ascertain if the disease is being disseminated by the milk of cows infected by *Br. abortus* or by *Br. melitensis*.

IV. Grenoilleau describes a case of undulant fever in a man.—T. M. DOYLE.

I. BOURGUIGNON, G. C. (1933). Le premier cas de fièvre ondulante diagnostiqué bacteriologiquement au Congo belge et ses affinités sérologiques avec le B. abortus. [**The First Case of Undulant Fever Diagnosed Bacteriologically in the Belgian Congo**].—*Ann. Soc. belge Méd. trop.* **13.** 249-258. 1 table, 1 chart. [12 refs.]

II. CRITIEN, A. (1933). **Abortion and Brucella Infection in Malta.**—*1er Congrès internat. Hyg. méditerranéenne. 1932.* **1.** 601. [Orig. in English].

I. Bourguignon describes a case of undulant fever in a man. The diagnosis was based upon the symptoms exhibited, serological tests, and on the isolation of a brucella on culture media from the urine of the patient.

II. Critien states that investigation has proved that all cases of undulant fever in Malta are caused by *Br. melitensis*.

There is no evidence that veterinary surgeons and stockmen contracted undulant fever from contact with brucella-infected cows and goats.—T. M. DOYLE.

WIGOCKI, L. (1933). Badanie zólci zdrowych swin na obecnosc paleczek grupy okreznicowo-durowej ze szczególnem uwzglednieniem paleczek podgrupy paratyfusu B. [**Presence of Paratyphoid Bacteria in the Bile of Pigs**].—*Przeglad Wet.* **46.** 267-281. 4 tables. [15 refs.] [Summary in German: abst. from orig.]

The bile of 680 healthy pigs was examined bacteriologically: it was found sterile in 295 cases (43 per cent.) and infected in 385 cases (57 per cent.). *Bact. coli* was present in 168 cases, *Proteus vulgaris* in 29 cases, Gram-positive cocci in 57 cases, staphylococci in five cases, Gram-positive putrefactive bacteria in 53 cases and various colon-typhoid bacteria in 93 cases. Amongst the latter, five different strains of *Bact. suipestifer* were identified and four further strains closely related to it.—K. SZCZUDLOWSKI (LWÓW).

I. SJÖFÄLT, N. (1933). En paratyfus-epizooti i en större svingård år 1932. **[Paratyphoid Outbreak in a Large Pig Farm in 1932]**.—*Skand. Vet.-tidskr.* **23.** 320-331. 2 figs., 1 table. [Summary in English: abst. from orig.]

II. MELJBO, E. (1933). Undersøgelser af Smudsprøver fra Jaernbanevogne anvendt til Transport af Kød og Flaesk med Henblik paa Foremonsten af Tyfus-Paratyfus-Enteritis-Svineparatyfusbakterier. **[Test for Typhoid-Paratyphoid Bacteria in the Dust of Railway Wagons used for Meat]**.—*Maanedsskr. Dyrl.* **45.** 204-210. 1 table. [1 ref.]

I. The disease began at the end of December, 1931, on a newly built and well-arranged pig farm with 670 pigs. The mortality increased and pigs that were sent to the state veterinary bacteriological institute at Stockholm were found to have died of a paratyphoid infection. Control inoculation with heart blood and spleen pulp of the dead pigs into healthy pigs excluded swine fever. *Post-mortem*, necrotic processes were found, especially in the mucous membranes of the mouth and fauces and in the large intestines; in some cases there was pneumonia. Thus there was no really characteristic picture [this *Bull.* **4.** 13]. The disease was combated by isolating the diseased pigs from the healthy ones and by watching for signs of disease among the healthy pigs; careful disinfection was done, especially in the premises where the healthy pigs lived. Separation was difficult to carry out effectively, as the symptoms were often indistinct. At the same time vaccination of both healthy and diseased pigs was resorted to, using a suspension of 0·1 volume per cent. of bacteria which was boiled for five minutes and to which there had been added 0·5 per cent. phenol. Four weeks after the vaccination the disease stopped and no further outbreaks were observed. Altogether 227 out of 670 animals died during the enzootic. No reference is made to the result of the bacteriological examination of the paratyphoid bacteria found.

II. Samples of dust from the floors of 60 railway wagons used for conveying meat were examined according to the method of Lentz and Tietz and modified by Mayer. Three dilutions of malachite-green were used (1 : 6,000, 1 : 8,000 and 1 : 12,000); the author found the 1 : 8,000 dilution the most satisfactory. In dust samples from one wagon Gärtner bacteria were demonstrated, otherwise pathogenic bacteria of the typhoid-salmonella group were not found in any case. The Gärtner strain found closely resembled the special mouse and rat pathogenic types, but differed from the latter in that it showed a very slight pathogenicity to mice in feeding experiments.—H. C. BENDIXEN (COPENHAGEN).

GILL, D. A. (1933). **Circling Disease: A Meningo-Encephalitis of Sheep in New Zealand. Notes on a New Species of Pathogenic Organism.**—*Vet. J.* **89.** 258-270. 7 figs. on 2 plates. [12 refs.]

The author previously published a progress report on this disease [this *Bull.* **1.** 89]. It affects more particularly the corpora quadrigemina and surrounding portions of the brain, the pons and medulla; an organism could be regularly cultivated by sowing out a suspension of brain substance from these areas on to blood agar.

The disease can be transmitted to sheep by intracerebral inoculation either of brain substance of affected sheep, or of cultures of the organism. Details of the morphological and cultural characters of the organism are given. It is a small Gram-positive bacillus, motile, with a polar flagellum, and is easily cultivated. The classification is difficult and at present it should be called the " New Zealand ovine-encephalitis organism."

Subcutaneous and intravenous inoculation and administration of the organism by stomach tube failed to infect sheep. Positive results were obtained by intranasal insufflation and by inoculation into the carotid artery. The fact that sheep can be infected intranasally opens up the possibility of sheep being predisposed to the disease by *Oestrus ovis* infection.

The organism is pathogenic for rabbits, causing meningitis and miliary foci in the liver.

The nature of the lesions suggests infection with a neurotropic virus, to which this organism may be secondary. The evidence so far is against this, but the author intends to carry out further filtration experiments. Seitz EK and Chamberland L5 filtrates gave negative results.—A. BROWNLEE.

SIERAKOWSKI, S., & LECZYCKA, E. (1933). Aenderungen der electrischen Leitfähigkeit in Bakterienkulturen. [**Changes in Electrical Conductivity in Bacterial Cultures**].—*Zlb. Bakt. I.* (*Orig.*). **127.** 486-492. 5 tables.

The electrical conductivity of bacterial cultures was measured by Kohlravsch's method, using an 0·1 per cent. potassium chloride solution as the standard. As long as the number of growing bacteria did not alter materially the electrical conductivity did not vary, but when bacterial bodies began to degenerate a marked rise of conductivity immediately became apparent. The possibility of this being a pure pH effect was excluded since, in both acid and alkali solutions, variation only appeared when obvious degeneration of the culture commenced. The phenomenon is probably dependent upon the release of the NH_3 radicle during protein catabolism.
—E. J. PULLINGER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

I. SASSUCHIN, D. (1933). *Nuttalia equi* n. sp. neuer Blutparasit der Pferde. [*Nuttalia* [*Babesia*] *equi* **n. sp., a New Blood Parasite of the Horse**].—*Arch. Protistenk.* **79.** 277-283. 20 figs. on 1 plate, 3 text figs. [26 refs.]

II. HILLERBRAND, N. (1933). Eine Piroplasmosis der Pferde im bayerischen Oberland. [**Equine Piroplasmosis in the Bavarian Highlands**].—*Münch. tierärztl. Wschr.* **84.** 481-484.

I. This paper records the detection of a small piroplasm of horses in south-east Russia. The parasites were associated with a disease considered locally to be a kind of meningitis. The commonest forms of the protozoa were small pears and rings 1·5 to 2μ long by 0·75 to 1μ broad. Maltese cross forms were also detected. The author considers that the organism is a small piroplasm of the nuttalia type but distinct from *Babesia equi.*

II. This is a preliminary report of observations on outbreaks of anaemia in horses in Bavaria, the disease being known locally as " liver staggers." The symptoms are emaciation, weakness, stiff movements, inability to lie down and a tendency to rest the head on the manger. The temperature usually varies from 37° to 38°C. The conjunctiva is icteric and congested. After staining blood smears with giemsa or May-Grundwald stains, the parasites appear as red points in the

red blood corpuscles. Sometimes the red dot is surrounded by a blue zone which almost fills the cell. Free forms are described in the blood and also in the urine. These forms are about the size of red blood corpuscles, possessing a nucleus which stains red and a cytoplasm staining blue. Larger forms with amoeboid nuclei are also described. The author proposes to call the organism *Piroplasma* [*Babesia*] *noricum* and suggests that the invertebrate host may be *Hippobosca equina* in smears of which similar organisms were detected.—U. F. RICHARDSON.

MALBRANT, R., & DUGUÉ, J. M. (1933). Les Trypanosomiases animales en Afrique Equatoriale Française. [**Animal Trypanosomiasis in French Equatorial Africa**].—*Rec. Méd. vét. exot.* **6.** 77-101 and 121-138. 3 tables. [17 refs.]

LESTER, H. M. O. (1933). **The Characteristics of some Nigerian Strains of the Polymorphic Trypanosomes.**—*Ann. Trop. Med. & Parasitol.* **27.** 361-395. 10 tables. [46 refs.]

The first paper deals generally with animal trypanosomiasis in the three French colonies of equatorial Africa. The tsetse fly distribution in the colonies is discussed; it corresponds approximately to the areas where trypanosomiasis is prevalent, but it is noted that in some areas tabanids seem to cause more damage than tsetse fly. It is said that game moving from tsetse fly areas to free areas carry trypanosome infection with them and that the tabanids in the free areas then transmit the disease from the game to domestic stock. *Tryp. congolense*, *T. vivax*, *T. pecaudi* and *T. brucei* are encountered; their virulence depends upon the species of animals affected, but strains of the same species of trypanosome vary in virulence. Certain races of sheep and goats seem to have some definite resistance, but it is considered that the resistance ascribed to certain races of cattle, ponies and donkeys has been much exaggerated.

The symptoms of the various infections, as seen in the different species of animals, are described. For diagnosis, examination of fresh and stained smears of blood and lymphatic gland is recommended and it is stated that, if fresh smear examination is negative, examination of dried smears is useless. It is considered that the technique of serological methods is too delicate for general use and that the results are difficult to interpret, whilst the auto-agglutination of red cells has no diagnostic value. Neither the formol-gel nor the sublimate tests gave satisfactory results in horses.

The second article records investigations into the characteristics of various strains of polymorphic trypanosomes from Nigeria and discusses the relationship between *T. gambiense*, *T. rhodesiense* and *T. brucei*. As regards virulence in small laboratory animals, some strains from cases of human sleeping sickness showed high and others low virulence whilst three *T. brucei* strains were all highly virulent. Tested as to their sensitiveness to tryparsamide, judged by the amount per kg. required to clear the peripheral blood of laboratory animals, two Nigerian sleeping sickness strains proved very sensitive and one comparatively resistant. A *T. gambiense* strain from a London laboratory was sensitive, whilst a laboratory *T. rhodesiense* strain was resistant.

In testing reactions to human sera the authors found that the sera must be fresh, and in a test of 214 sera only one, from a syphilitic, showed any marked diminution of trypanocidal power. Two sleeping sickness strains, the two London laboratory strains and all the *T. brucei* strains were sensitive to human sera, but the majority of the Nigerian sleeping sickness strains were insensitive.

Three Europeans and 40 natives were inoculated with *T. brucei*, but no infection occurred.

The author agrees with KLEINE that *T. rhodesiense* is purely a virulent strain of *T. gambiense*, but considers that their relationship to *T. brucei* must remain doubtful until it proves possible to infect man with the last trypanosome.

—U. F. RICHARDSON.

I. LWOFF, Marguérite. (1933). Recherches sur la nutrition des trypanosomides. [**Research on the Nutrition of the Trypanosomidae**].—*Ann. Inst. Pasteur.* **51.** 55-116. 17 tables. [72 refs.]

II. TOPACIO, T. (1933). **A Simple Technic for Isolating Single Trypanosomes.** —*Philippine J. Sci.* **51.** 631-635. 6 figs. on 4 plates. [5 refs.]

III. JONES, E. R. (1933). **Blood-Sugar and Blood-Urea in Trypanosomiasis. Preliminary Investigation.**—*Vet. Rec.* **13.** 1062-1063. 1 table. [18 refs.]

I. This article discusses the influence of blood in media for the cultivation of various Trypanosomidae. The active element of the blood is haematin and this can be replaced by the catalase of calves' livers or vegetable peroxydases which are combinations of iron porphyrine. An artificial peroxydase, potassium ferrocyanide and sulphate of iron, can be utilized for the cultivation of some organisms, but others, such as *Leptomonas fasciculata*, from the mosquito, require the addition of gum arabic. This need for active iron probably represents a deficiency of respiratory ferment.

II. The method described consists in fixing a strip of cellophane paper to a slide by serum fixative ; placing about ten tiny drops of infected blood, diluted with plasma till a small drop on the paper contains three or four trypanosomes, it is then mounted and examined under a low magnification. As soon as a drop is detected containing a single trypanosome, a tiny drop of 30 per cent. plasma is added to prevent drying and the examination of other drops is continued. Drops containing single trypanosomes can be removed by cutting the paper mount and lifting the section with cover-glass forceps.

III. This paper records investigations into the blood sugar and blood urea value of cattle in Uganda. Blood sugar estimation was carried out by McLean's method and blood urea by Ambard's method. Observations were made on normal animals and on animals infected by *Tryp. vivax*, *T. congolense*, *T. rhodesiense* and *T. gambiense*. Only one case of hyperglycaemia was observed and that after injection with " cyclosan." No cases of hypoglycaemia were evident. One very high value of blood urea was encountered and here again the increase followed injection of " cyclosan." Some low blood urea figures were evident in *T. congolense* cases, but the investigations were too limited to allow of definite conclusions.

—U. F. RICHARDSON.

CAMINOPETROS, J. (1933). Les leishmanioses en Grèce. Données épidémiologiques et expérimentales. [**Leishmaniasis in Greece. Epidemiological and Experimental Observations**].—*1er Congrés internat. Hyg. méditerranéenne. 1932.* **1.** 347-360. 11 figs. [14 refs.]

ANDERSON, C. (1933). Nouvelle contribution à l'étude du problème du kala-azar. Culture du virus en lait de chèvre. [**The Kala Azar Problem. Culture of the Virus in Goats' Milk**].—*Ibid.* 374-377. [2 refs.]

The first article discusses the incidence of human and canine leishmaniasis in Greece. The majority of human cases occur in children under ten years old. Athens is the most heavily infected centre, and in that city 7 per cent. of dogs are infected.

The disease in dogs is characterized by cutaneous lesions, with deep ulcers usually occurring on the feet and neck, with enlargement of the popliteal and

cervical glands. The parasites can be demonstrated in smears from the ulcers, glands and liver. It was found that the spermophile [*Citellus* sp.] was very susceptible to inoculation ; parasites appeared in the blood in 15 to 20 days and death occurred in two to five months. Inoculation of spermophiles with emulsions of *Rhipicephalus sanguineus* from infected dogs showed that the ticks harboured the parasites even through a moult.

The second article suggests that kala azar may be transmitted by infection through the digestive tract, and in 16 out of 19 cases it was found that goats' milk was a component of the diet. It was found that leishmania could be cultivated in pure goats' milk and the addition of goats' milk to culture media favoured the growth of the parasite.—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

WALKER, J. (1933). **East African Swine Fever.**—*Thesis for Veterinary Doctorate, Zurich.* pp. 139. 3 figs., 10 tables. [35 refs.]

This is a detailed description of the author's investigation of East African swine fever with a résumé of the work carried out by MONTGOMERY [(1921). *J. Comp. Path. & Therap.* **34.** 159 and 243.] and STEYN.

It deals, among other points, with the geographical distribution, aetiology, diagnosis, symptoms, pathological anatomy and histology, immunity and differentiation of the disease from *true* swine fever.

" East African swine fever is a highly contagious peracute disease of domestic pig ; the bush pig (Potomochoerus) and wart hog (Phacocoerus) can harbour the virus, but usually manifest no objective symptoms."

The disease is caused by a virus that can be readily filtered through Berkefeld and Seitz filters, and with difficulty through Chamberland L3 candles.

As far as is at present known, the disease is confined to East Africa and the Transvaal.

In 15 outbreaks in East Africa reported by MONTGOMERY the total number of pigs involved was 1,366. Of these 1,352 died, a mortality rate of 98·9 per cent.

The porcine species only is susceptible to infection. The domestic pig is highly susceptible both to artificial and natural infection. There is nothing characteristic about the symptoms exhibited by affected domestic pigs and, except that diarrhoea does not apparently occur, they are similar to those observed in European or American swine fever [hog cholera].

At autopsy the principal lesions observed are petechial haemorrhages on the thoracic and abdominal organs, enlarged and haemorrhagic lymphatic glands, and a varying degree of gastro-enteritis. There is usually an enlarged spleen.

Walker carried out a considerable amount of work in an endeavour to obtain a practical and reliable method of active immunization, but with little success. Dead virus conferred no protection. Attenuation of the virus by heat, chemical agents, chemical agents plus storage, and by several other expedients failed to yield results of practical value.

The best results were obtained by the serum-virus method, but the immunity conferred was transitory and of a low grade.

East African swine fever could easily be confused with European or American swine fever and the only reliable method of differentiation between the two diseases is by cross-immunity tests.

The author points out the necessity for information regarding the channels

by which the infection may be introduced into a herd, and particularly regarding the possibility of there being an intermediate host.

[As the work of MONTGOMERY, STOCKMAN, STEYN and Walker has established East African swine fever as a separate entity, a new name should be found for it in order to avoid confusion with *true* swine fever.

The name suggested by Walker—pestis suum africana—hardly meets the case, as *true* swine fever also occurs in Africa.

This monograph is a valuable addition to our literature on a serious but little known virus disease which, with the further settlement of East Africa, may easily assume a primary economic importance to stock-owners].—T. M. DOYLE.

I. & II. STIRLING, R. F. (1932-33). **Some Experiments in Rinderpest Vaccination : Active Immunisation of Indian Plains Cattle by Inoculation with Goat-Adapted Virus Alone in Field Conditions. (First and Second Reports).** —*Vet. J.* **88.** 192-204 and **89.** 290-306. 3 figs. on 1 plate, 8 charts, 2 maps. [4 refs.]

III. VAN SACEGHEM. (1933). Le formol vaccin contre la peste bovine. [**Formol Vaccine against Rinderpest**].—*Ann. Soc. belge Med. trop.* **13.** 367-371. [4 refs.]

IV. FULTON, A. (1933). **An Immunisation Camp.**—*Vet. Rec.* **13.** 1296-1298. 2 figs.

I. On account of the prohibitive cost [2s. 6d. per head] of applying the serum-virus method of immunization against rinderpest on a large scale, the author has tested the possibilities of immunizing cattle by the use of " goat virus " [rinderpest virus attenuated by passage through goats—method introduced by J. T. EDWARDS] alone. Ten lots of Indian plains cattle, comprising a total of 343, were inoculated by this method, only one death resulting. The inoculations were followed by mild rinderpest reactions, but no serious effects were observed. All the inoculated animals subsequently resisted a dose of virulent rinderpest virus.

II. This paper is a second report on the immunization of Indian plains cattle by means of " goat virus " alone. A total of 7,435 cattle have been inoculated by this method with excellent results. It is now proposed to use the method on a large scale.

III. van Saceghem states that the action of formolized rinderpest virus is essentially of a preventive nature and that it is only when administered in large doses (500 c.c.) that it has any influence on the course of the disease [experience has shown that the administration of vaccine has no appreciable effect once the disease is established].

IV. A description of a permanent cattle camp suitable for the handling of large numbers of cattle for immunization against rinderpest, or for other similar purpose. Suggestions are given as to selection of site, type of buildings, crush-pens, etc.—T. M. DOYLE.

I. KLOBOUK, A. (1931). Encephalomyelitis enzootica suum (Těsínská nemoc). Predběžné sdělení. [**Encephalomyelitis Enzootica Suum (Teschin Sickness). Preliminary Report**].—*Zverol. Rozpravy.* **5.** 95.

II. KLOBOUK, A. (1931). Encephalomyelitis enzootica suum. Část I. Studie Klinická a pathologicko—anatomická. [**Encephalomyelitis Enzootica Suum. Part I. A Clinical and Pathological-Anatomical Study**].—*Zverol. Obzor.* **24.** 436-444, 460-464 and 477-480.

III. KLOBOUK, A. (1933). Encephalomyelitis enzootica suum. Část II. Pokusy o umělé prenesení choroby na zdravé vepre materiálem z vepru nemocných.

[**Encephalomyelitis Enzootica Suum. Part II. Experiments on Artificial Transmission of Disease to Healthy Pigs by Material from Sick Pigs**].—*Zverol. Rozpravy.* **7.** 97-103 and 109-117.

IV. Kloubouk, A. (1933). K otázce aetiologie tak zv. těsínské nemoci—Encephalomyelitis enzootica suum (obrna veprů). Predbězné sdělení. [**Aetiology of So-Called Teschin Sickness—Encephalomyelitis Enzootica Suum. Preliminary Report**].—*Ibid.* 85. [The 1931 references are included to link up with the recent publications].

In the eastern division of Moravia (Czechoslovakia) in the districts Těsín, Moravká Ostrava and Nový Jicín, there occurs a disease of swine characterized by lameness and clonic-tonic spasms. Nothing was known about the nature of this disease and many were even inclined to regard it as the initial stage of rickets.

The author has undertaken a systematic study of the disease and the following are the reports on the results of investigations already performed :—

I. Brief report on one successful experimental transmission. A healthy pig inoculated subcutaneously with a suspension prepared from the organs of a diseased boar became infected 33 days later, with powerful clonic-tonic spasms.

II. During the year 1931, the author examined 11 diseased pigs sent to him by veterinary practitioners from an infected area. Six of them arrived alive and were examined clinically. Paralysis, of varying degrees of severity, was the chief symptom. In the mild type of the disease there was slight paresis of the hind legs and the walk was unsteady and swaying. In severe cases the pigs were found lying on one side and unable to rise. In less severe cases the animals moved over the floor with great difficulty drawing their hind quarters after them.

In three cases, attacks of clonic-tonic spasms were observed as well as paralysis. An attack of spasms could be provoked by tapping a tendon or by forced movement. In two severe cases nystagmus was observed. Consciousness was undisturbed even in severe cases ; in mild cases the appetite was good, but it was necessary to support the animals while feeding because of their inability to raise themselves.

Fever occurred at the onset of illness. In one case the body temperature was 40·1°C., and in five other cases it varied from 38·4° to 39·8°C. Before death the temperature dropped below normal ; in one case the temperature was 36·4°C. 12 hours before death.

The pathological-anatomical picture found on *post-mortem* examination was not characteristic. Sometimes there were no lesions : sometimes slight alterations characterized by hyperaemic changes and oedema in the lungs, redness of the nasal mucous membrane especially on the ethmoidal bones, slight hyperaemia of the liver, spleen and kidneys ; sometimes mild degeneration of the kidneys and hyperaemia of the brain and spinal cord meninges were observed.

The cut surface of the spinal cord and brain showed petechiae and striae.

The histological examination of the central nervous system of animals, which had died or had been killed, revealed important lesions. In all cases perivascular lymphocytic foci, differing in size, number and density in various parts of the nervous tissue, were distributed throughout the brain and spinal cord. It is noticeable that lymphocytic infiltrations in the spinal cord were localized mostly in the grey matter (in the ventral horns).

The described disease is an encephalomyelitis and is similar to infantile paralysis (anterior poliomyelitis).

III. Experiments were carried out on 16 pigs which were inoculated with an emulsion prepared from the organs of pigs affected with encephalomyelitis enzootica suum which had been sent for examination by veterinary practitioners.

Inoculation was given subcutaneously in eight cases, subcutaneously and under

the nasal mucous membrane in two cases and subcutaneously, submucously and by spraying the suspension on the surface of the nasal mucous membrane in six cases. In 14 cases the suspension injected was prepared from brain and spinal cord and in two cases from liver, spleen, kidneys and lymphatic glands.

A disease identical with the natural condition was produced in three out of 16 cases. The results were confirmed by the syndrome and the pathological-anatomical and histological alterations in the central nervous system.

IV. The author states that the results of the preliminary experiments indicate that the cause of this diseaseis an ultravisible virus capable of passing a Berkefeld filter.—E. Pribyl (Brno).

Remlinger, P., & Bailly, J. (1933). La vaccination antirabique des animaux au Maroc en 1932. [**Vaccination of Animals against Rabies during 1932 in Morocco**].—*Bull. Acad. vét. France.* **6.** 115-121. 4 tables.

During the period 1928 to 1932 about 3,142 dogs were inoculated against rabies at the Pasteur Institute, Tangiers.

In about 10 per cent. of these cases the vaccine was used on dogs that had been bitten by animals suspected of rabies ; in many instances confirmation of the diagnosis was not possible. In some instances, however, a diagnosis of rabies was established and the protective value of the vaccine was fully demonstrated.

The authors are highly satisfied with the results obtained from the use of the vaccine under exacting field conditions and are of the opinion that its scope of employment should be enlarged.—T. M. Doyle.

I. Remlinger, P., Rossi, P., & Bailly, J. (1933). La maladie d'Aujeszky existe-t-elle en France ? [**Does Aujeszky's Disease occur in France ?**]—*Bull. Acad. vét. France.* **6.** 267-271. [5 refs.]

II. Remlinger, P., & Bailly, J. (1933). La maladie d'Aujeszky existe-t-elle au Maroc ? [**Does Aujeszky's Disease occur in Morocco ?**]—*Maroc-Méd.* 15th July. 380-381. [3 refs.]

I. The authors bring forward considerable circumstantial evidence that an outbreak of Aujeszky's disease occurred in 1932 in the Louhans [Saône-et-Loire] region of France. Unfortunately, in the circumstances, it was not possible to confirm the diagnosis by animal inoculation.

The outbreak was preceded and accompanied by an invasion of rats, a fact that has frequently been observed in connection with epidemics of the disease in Hungary and in Brazil. The rat would appear to be a carrier of the virus. The outbreak in Louhans occurred mainly among cats ; the disease occurs more frequently in cats than in dogs.

The symptoms observed among animals in Louhans were identical with those occurring in either artificially or naturally affected animals. In view of the absence of aggressiveness among affected animals and the rapidity of onset of the paralytic symptoms, outbreaks tend to be limited in extent.

This article contains a useful table showing some of the principal differential symptoms exhibited by animals affected with rabies and with Aujeszky's disease respectively.

The intense pruritus shown by animals affected with Aujeszky's disease is a symptom of considerable diagnostic importance. A reliable diagnosis can, however, be obtained only by animal inoculation.

II. The disease has not yet been recognized in Morocco. The authors appear to anticipate an increase in the prevalence of Aujeszky's disease in the future.

—T. M. Doyle.

KRANEVELD, F. C., & DJAENOEDIN, R. (1933). Over de biologie van het virus der peristomatitis bij schapp en geit. [**Biology of the Virus of Ovine and Caprine Peristomatitis**].—*Ned.-Indisch. Blad. Diergeneesk.* **45.** 311-339. 11 tables. [Summaries in English and German : abst. from orig.]

A contagious peristomatitis occurs in sheep and goats in the Dutch East Indies. The authors investigated the condition and made the following conclusions :—there was uniformity of two virus strains from different districts ; there is no immunological relation to sheep pox ; the virulence can be increased by passage through sheep ; the virulence is maintained for at least 12 months in dry material stored in the dark ; the virus is attenuated after heating in a water-bath for ten minutes at 60° and 80°C., and is killed in 15 minutes at the same temperature ; immunity follows recovery from the disease or vaccination.

—A. KLARENBEEK (UTRECHT).

DAUBNEY, R., & HUDSON, J. R. (1933). **Rift Valley Fever.**—*East Afric. Med. J.* **10.** 2-19. 7 tables, 6 charts. [13 refs.]

This paper is a summary of lectures delivered to the local branch of the British Medical Association in December, 1931 and December, 1932.

An account is given of attempts to transmit the disease through the agency of various species of culicine mosquitoes. Three species of *Monsonia*, *M. fuscopennata*, *M. versicolor* and *M. microannulata* have been proved to harbour the virus for periods up to nine days after an infective blood-meal, a single mosquito containing sufficient virus to infect a susceptible mouse by inoculation. The virus also survived seven days in other culicine species, which the authors think may be excluded on epizootiological grounds from consideration as vectors.

The immunity of an animal recovered from Rift Valley fever is of a very high order. It is demonstrated that unweaned lambs, born of ewes that have passed through an attack of the disease from one to two and a half years prior to the birth of the lamb, are passively immune. The resistance of the lambs is rapidly lost after weaning, which proves that the immunity is merely a passive one.

Taking into consideration the marked decline in susceptibility with increasing age, it is suggested that practical advantage should be taken of this position to immunize ewes by the serum-simultaneous method, with a view to preventing serious epizootics among very young lambs.

The relative susceptibility of 37 species of wild, domesticated and laboratory animals has been tested by virus inoculation and is given in tabulated form.

—R. DAUBNEY.

FINDLAY, G. M. (1933). **Cytological Changes in the Liver in Rift Valley Fever, with Special Reference to the Nuclear Inclusions.**—*Brit. J. Exp. Path.* **14.** 207-219. 24 figs. on 1 plate. [21 refs.]

The most important changes caused by the virus of Rift Valley fever in the nuclei of the liver cells are the margination of the chromatin in the nuclear membrane and the appearance of acidophilic material in the nucleoplasm. To accumulations of acidophilic material in the nucleus associated with a number of virus infections it has been customary to apply the term " intranuclear inclusions." The acidophilic intranuclear inclusions associated with Rift Valley fever were first described by DAUBNEY, HUDSON and GARNHAM [(1931). *J. Path. & Bact.* **34.** 545.] in the liver cells of sheep. Findlay (1932) confirmed the occurrence of these inclusions in sheep and also found them in the livers of goats and rhesus monkeys, as well as in a number of small rodents (mice, rats, field voles, wood voles, grey squirrels and golden hamsters) which are susceptible to infection.

The inclusions develop in the nucleoplasm of the liver cells and are visible in fresh preparations. They do not give a reaction for fats, thymonucleic acid or masked iron. Their morphology and tinctorial properties are described in this article and are compared with liver inclusions caused by other viruses. The lysis of mitochondria and the disruption of the Golgi apparatus in the liver cells in Rift Valley fever are also described.—LL. E. W. BEVAN.

ACEVEDO, R. A. (1933). **An Atypical Form of Avian Pest.**—*Gaz. Bureau Anim. Indust. Philippine Is.* **3.** 80-87. [10 refs.]

[The term " avian pest " used by the author refers to the widespread disease of fowls caused by a virus, which has been described by various workers under the names " Newcastle disease " (England), " pseudopest " (Java) and " Ranikhet disease " (India). With the exception of MANNINGER—this *Bull.* **3.** 80.—all who have studied this disease are of the opinion that it is a separate entity].

Acevedo describes an outbreak of disease among fowls in Manila caused by a virus and proved by cross-immunity tests to be identical with " avian pest " previously reported from the Philippine Islands by other workers.

He proved that the virus was present in the peripheral blood and in one instance blood diluted to 1 : 100,000 set up a non-fatal infection when inoculated intramuscularly into a susceptible fowl.

He mentions that seven artificially infected fowls did not exhibit the gasping respirations which are almost pathognomonic of the naturally occurring disease. [This respiratory symptom is frequently absent in artificially infected fowls].

—T. M. DOYLE.

I. DURAND, P. (1933). Etude expérimentale de quelques virus exanthématiques chez le chien. **[Experimental Study of Some of the Eruptive Fever Viruses in the Dog]**.—*Arch. Inst. Pasteur, Tunis.* **21.** 484-503. 2 tables, 7 graphs. [8 refs.]

II. KODAMA, M., & KONO, M. (1933). **Studies on Experimental Transmission of Virus of " Eruptive Fever " and " Typhus " by Several Blood Sucking Insects.**—*Kitasato Arch. Exp. Med.* **10.** 99-112. [20 refs.]

III. CAMINOPETROS, J., PHALOUKIS, J., & CONTOS, B. (1933). Sensibilité du cheval au virus de la fièvre boutonneuse (" Rickettsia Blanci " n.sp.). **[Sensitivity of the Horse to the Virus of Marseilles Endemic Typhus]**.—*Bull. Acad. Méd. Paris.* **109.** 835-837. [1 ref.]

I. Dogs are receptive to the inoculation of various types of typhus fever, despite the fact that no clinical symptoms are shown. Infection with African typhus, Mexican typhus, Toulon typhus and Rocky Mountain spotted fever were all found to cause a positive reaction to the Weil-Felix test, whatever the route of inoculation used. The reaction was constant for *Proteus vulgaris* OX 19, almost constant for OX 2, and on a few occasions the titre for OX 2 exceeded that for OX 19. With every strain except Rocky Mountain spotted fever the virus was recovered by the inoculation of blood or tissue suspensions into guinea pigs or rats. Dog to dog transmission met with no success and the Weil-Felix and inoculation tests were constantly negative. The author considers that dogs in certain countries suffer natural infection ; their subsequent immunity is shown only by the inability to raise the Weil-Felix titre by inoculation.

II. The author discusses the transmission of human typhus and " eruptive fever " by fleas, lice, mites, bed bugs and ticks. Apart from the observations of purely human interest, cat fleas (*Ctenocephalus felis*) transmitted human typhus, but dog fleas (*C. canis*) did not transmit it ; the importance of the observations rests on the possibility of the dog or cat acting as reservoirs.

III. Both human beings and guinea pigs have been found to react to smaller doses of typhus virus given intradermally than if given by other routes. Horses, inoculated intradermally, will suffer a febrile reaction with local swelling. The blood only gives a feeble reaction to the Weil-Felix test, but repeated doses result in a lessening of the local reaction and final immunity, while the blood gains an increasing power of neutralization over the virus ; after two inoculations, 4 c.c. of serum completely neutralized a 2 c.c. infective dose of virus.

—NORMAN HOLE.

BEDSON, S. P. (1933). **Observations on the Developmental Forms of Psittacosis Virus.**—*Brit. J. Exp. Path.* **14.** 267-277. 3 tables. [4 refs.]

This is a continuation of the author's work on the virus of psittacosis [this *Bull.* **4.** 165]. The virus passes through a developmental cycle, the early stages being large homogeneous masses (" plaques ") ; later the virus masses are no longer homogeneous, but are composed of forms more or less equal in size up to 1μ or more in diameter (" large forms "). The large forms divide and give rise to the elementary bodies.

The developmental cycle of the virus takes about 48 hours to complete, that is, for the elementary bodies to pass through the various forms and back again to elementary bodies.

The " plaques " stage was found to be much less virulent than that of the elementary bodies.

The large forms of the virus filter less readily than the elementary bodies, but curiously enough the smaller elementary bodies are thrown down more readily by centrifugation.—T. M. DOYLE.

DISEASES CAUSED BY METAZOAN PARASITES.

FREUND, L. (1933). Zur Morphologie der Gastrophiluseier. **[Morphology of the Eggs of Gastrophilus].**—*Arch. wiss. prakt: Tierhlk.* **66.** 393-402. 2 figs. [17 refs.]

Freund first discusses the nomenclature of the most important species of *Gastrophilus* in Central Europe, viz.:—*G. intestinalis* (de Geer, 1776), *G. haemorrhoidalis* (Linn., 1761), *G. veterinus* (Clark, 1797) and *G. pecorum* (Fabricius, 1794). Reference is made to six other less known species. The common names of the above four flies are discussed. Then follow detailed accounts of their eggs together with remarks on those of *G. inermis*. The eggs of *G. intestinalis* and *G. veterinus* are figured. Each species of egg is elaborately described under the headings of (a) localization, (b) method of hatching, (c) shape, (d) size and (e) colour.

Following this morphological account is a description of the biological aspects of egg deposition and the wanderings of some of the first stage larvae up to the time of entering the mouth.—A. W. N. PILLERS.

BAUDET, E. A. R. F., & NIESCHULZ, O. (1933). Over Myiasis bij schapen veroorzaakt door larven van Lucilia sericata. **[Larval Myiasis in Sheep caused by** *Lucilia sericata***].**—*Tijdschr. Diergeneesk.* **60.** 573-580 and 648-659. 6 figs. on 1 plate. [Summaries in English, French and German : abst. from orig.]

In the summer of 1932 a very extensive invasion of *Lucilia sericata* larvae in sheep in the Wieringermeerpolder (a newly reclaimed area of the bottom of the Zuider Zee) took place, but this did not occur in the neighbouring old polders. It was supposed that this phenomenon was connected with the absence of the

natural enemies of *L. sericata* (the ichneumon fly) in this newly reclaimed land. By cultivation in a room with a temperature of 26°C. and a moist atmosphere, the development of *Lucilia* was studied. The very young larvae, distinguished by only two stigmata in the posterior tracheal openings, were more resistant to larvicidal drugs than the older larvae which possess three stigmata in each posterior tracheal opening. In tests of 13 different drugs, undiluted chloroform and carbon tetrachloride were among the strongest larvicides : dilutions of these chemicals gave less satisfactory results. A mixture of equal quantities of oleum picis, oleum terebinthinae and methylated spirit was very effective after contact for one minute. It is not improbable that in practice this concentration would irritate the tissues. The larvae were destroyed after two and a half minutes by an ointment containing pix liquida (10 per cent.), turpentine, oleum terebinthinae, petrol, methylated spirit and soft soap. Mixture D (oleum picis, cottonseed oil, petrol and carbolic acid), recommended by the Joint Blowfly Committee in Australia, was also satisfactory for adult larvae. The oil reduced the effect, but it is serviceable in soothing the irritation of the drugs on the wounds. Rotenone, derris powder and a series of other chemicals had little or no effect on the larvae.

—J. VAN DER HOEDEN (UTRECHT).

LAOTHR, & SZIDAT, Ursula. (1933). Beiträge zur Kenntnis der Trematoden der Monostomidengattung Notocotylus Dies. [**A Contribution to the Study of the Monostomial Trematodes of the Genus** *Notocotylus*].—*Zlb. Bakt. I.* (*Orig.*). **129.** 411-422. 12 figs., 2 tables. [12 refs.]

This is an account of some morphological studies of adults and feeding experiments with cercariae belonging to the genus *Notocotylus* Diesing. These monostomes occur chiefly in the alimentary canal of various species of water fowl and a few mammals. There is a discussion as to the value of the openings of the groups of glands which occur on the ventral surface for separating the various species of the genus. Many are figured. The conclusion arrived at is that the number and disposition of these gland openings are of value, but that in some cases the developmental life story is also necessary. A table shows the measurements of 10 individuals of *Cercaria ephemera* Nitzsch and *C. vaga* n. sp. The feeding of the former, obtained from *Planorbis corneus* L., resulted in a new species, *Notocotylus thienemanni*, with nine to ten gland openings in the two lateral rows and 12 in the middle one. *C. vaga* from the snail *Lymnaea palustris* when fed to young ducks gave rise to adults *N. attenuatus* Rud. There is a discussion on the number of gland openings in *N. gibbus* Mehlis.

A table gives the characters and measurements of 9 species of the genus together with the size of the eggs, the names of hosts and cercariae and intermediate hosts where known.

The need for further work on the biology and life cycles of the group including extra-European forms is emphasized.—A. W. N. PILLERS.

I. STEWARD, J. S. (1933). *Onchocerca cervicalis* (**Railliet and Henry 1910**) **and its Development in** *Culicoides nubeculosus* **Mg.**—*Third Rep. Direct. Inst. Anim. Path. Univ. Cambridge. 1932-33.* pp. 272-284. 24 figs., 9 plates. [9 refs.]

II. STEWARD, J. S. (1933). **The Occurrence of** *Onchocerca cervicalis* **in Cases of Fistulous Withers and Poll Evil.**—*Ibid.* pp. 285-297. 7 figs. on 4 plates, 1 table. [14 refs.]

I. Steward describes the adult male and female *Onchocerca cervicalis* (Railliet and Henry 1910), from a case of fistulous withers in a horse in Herefordshire.

Embryonated eggs were obtained from the cut ends of a female. Microfilariae measuring from 160 to 200μ long and 2 to 4μ wide were subsequently found in the skin of the horse from 8 a.m. to 6 p.m. in April. In the search for a possible vector, 300 simuliids were dissected for microfilariae after they had engorged on an affected animal. The species examined were *Simulium morsitans*, *S. equinum*, *S. ornatum*, *S. latipes* and *S. argyreatum*. They were all negative with the exception of one specimen of *S. morsitans* which contained a dead and disintegrating microfilaria. The species of *Haematopota*, *Chrysops*, *Stomoxys*, *Culex* and *Anopheles* examined were also negative.

In May, 1932, various species of *Culicoides* were found feeding on the affected horse between 7 p.m. and 10 p.m. Of 172 specimens of *C. obsoletus*, nine were found to harbour living microfilariae. *C. parroti* and *C. nubeculosus* were also found to be infected. As the latter species could be obtained in large numbers, it was used for experimental purposes. The methods of catching, rearing and feeding are described. Microfilariae, on being taken up in the blood by the midge, pass into the midgut and 48 hours after ingestion they measure 210μ long by 5μ wide. Seven days after feeding, the microfilariae are found in the thoracic muscles and measure 133 to 240μ long by 17 to 27μ wide. About the 20th day, the microfilariae migrate towards the head of the insect where they arrive on the 22nd day and may then be found in the proboscis : they now measure from 600 to 700μ long and 18 to 21μ wide. When heads of infected midges were dissected in warm horse serum, the microfilariae showed a definite tendency to emerge, possibly through the membranous areas at the base of the proboscis. Between 5 and 6 per cent. of midges, dissected within 24 hours of feeding on the infected horse, harboured microfilariae, the largest number in one fly being 26. 126 control midges fed on a pony shown to be free from microfilariae were all negative.

All stages of the parasite in the horse and in the vector are illustrated from 21 micro-preparations. The author states that whereas, according to Blacklock, *Onchocerca volvulus* of man takes seven to eight days to pass through its development in *Simulium damnosum* in tropical West Africa, *O. cervicalis* takes 24 to 25 days to do the same in this country in *Culicoides nubeculosus*. He is of opinion that possibly other species of *Culicoides* may act as vectors.

II. The author deals first with previous records of the finding of *Onchocerca cervicalis* in cases of fistulous withers and poll-evil of horses in different countries from 1861 to 1931. Then follows an account of the association of *Br. abortus* with these diseases, especial mention being made of the conclusion of Fitch, Delez and Boyd that *Br. abortus* is associated rather closely with poll-evil and fistulous withers. Steward examined 30 horses suffering from these diseases and 20 (66·6 per cent.) harboured the worm. Twenty-six were examined for agglutinins against *Br. abortus* ; seven (27 per cent.) were negative and four of these (57 per cent.) harboured *O. cervicalis*. Agglutinins were detected in 19. Thirteen (50 per cent.) agglutinated at 1 : 100 or less and 11 of these (84·6 per cent.) were infested with the worm ; four (15·4 per cent.) agglutinated *Br. abortus* at a dilution of over 1 : 100 and up to 1 : 400 and three of these (75 per cent.) harboured *O. cervicalis* ; two (7·7 per cent.) agglutinated at dilutions of over 1 : 400 and neither had worms in the lesions. *Br. abortus* was obtained once from 12 cases examined culturally and biologically.

The cases are then described in chronological order. There are photographs of a case of poll-evil, of the nematode in the ligamentum nuchae and in transverse section under low and high magnifications. A case is described of an apparently normal horse which on *post-mortem* examination showed several worms in both the lamellar and funicular portions of the ligamentum nuchae at the poll and withers.

The animal had received 50 c.c. of a virulent culture of *Br. abortus* by intravenous injection 12 weeks previously and showed two well-marked cavities (12 mm. by 7 mm. each) in a small portion of the ligament. [The presence of worms in animals showing no symptoms has been used as an argument against the parasitic origin of fistulous withers and poll-evil, as well as the presence of the disease when the worm cannot be found, but both of these arguments do not disprove that some cases may be due to the worm].—A. W. N. PILLERS.

I. DOERR, R., & MENZI, Elsa. (1933). Studien über den Mechanismus der Trichinelleninfektion. VIII. Vergleichende Untersuchungen über die Empfänglichkeit der Ratte und des Meerschweinchens für die Infektion per os. [**Studies on Trichinella Infection. VIII. Comparative Tests on the Susceptibility of the Rat and Guinea Pig to Infection** *per os*].—*Zlb. Bakt. I. (Orig.).* **128.** 177-188. 2 tables. [10 refs.]

II. TRAWINSKI, A., & METERNOWSKA, I. (1933). Ueber Invasionsfähigkeit junger Muskeltrichinen. [**The Infectivity of Young Trichinella Larvae**].—*Ibid.* 328-331. [8 refs.]

I. Infection with two or three trichinae constantly leads to invasion of the muscles by larvae in rats but not in guinea pigs, an intestinal infection of between 10 and 40 worms being necessary in those animals. The numbers of larvae invading the muscles of rats which have received an initial dose of two to 40 trichinae bear no relation to the initial dose. A dose of 3,000 trichinae produces a muscle infection in guinea pigs equal to that produced in rats by the same infective dose. This requirement of a minimal infective dose for the guinea pig is similar to what is required to produce infection with bacteria, where a certain dose is requisite to overcome the host's resistance to the initial infection.

II. Failure to infect susceptible animals with *Trichinella* has been ascribed by some authors to a supposed action of the pancreatic juice in killing the larvae. The two authors of this paper have carried out tests on rabbits and dogs and also *in vitro* tests in pancreatic juice, which show the larvae to be well able to resist the digestive action in the stomach. Further observations which they also carried out showed that the larvae do not reach the infective stage until they have resided in the new host for at least 19 days and it is thought that failure in producing infection must be due to the use of larvae not old enough to have reached the infective stage.—E. L. TAYLOR.

I. AUGUSTINE, D. L. (1933). **Effects of Low Temperatures upon Encysted** *Trichinella spiralis*.—*Amer. J. Hyg.* **17.** 697-710. 3 tables, 2 charts. [5 refs.]

II. HENNEBERG, O. H., & BACHLECHNER, K. (1933). Ueber die Abtötung von Trichinellen in Salamiwürsten. Experimentelle Untersuchungen. [**The Destruction of** *Trichinella* **in Bologna Sausage**].—*Wien. tierärztl. Mschr.* **20.** 350-369. 4 figs., 1 table. [36 refs.]

I. This series of observations confirms the results obtained by previous investigators and adds a little to our knowledge of the subject. Temperatures as low as –21°C. did not injure the parasite, –27·6°C. resulted in reduced vitality, –33·9°C. rendered the larvae harmless and –34·6°C. killed them. Complete destruction of the larvae was also brought about by rapidly reducing the temperature to –18°C. and maintaining it there for 24 hours. The fall of temperature in the experimental pieces of meat (approximately 4 lb. each) was observed by means of a thermo-couple : at 15°C. the time required for the centre of the meat to reach that temperature, starting from 8°C., was over 42 hours by the slow process of freezing and 3 hours 20 minutes by the quick process. Similar figures are given for other temperatures.

II. Observations were carried out by the use of the trichinoscope and by animal inoculation on the viability of the larvae of *T. spiralis* in Bologna sausage, showing that they are infective at the third day of smoking but are incapable of infecting at the 13th day. It is considered that they should be kept for 28 days before being released on to the market.—E. L. TAYLOR.

IMMUNITY.

GORDON, J. (1933). **The Bactericidal Power of Normal Serum.**—*J. Path. & Bact.* **37.** 367-380. 2 figs. [Copied *verbatim* from *Bull. Hyg.* **9.** 201-202. Signed by W. W. C. TOPLEY].

The author records a series of experiments which form an extension of the work previously reported in collaboration with CARTER [*Bull. Hyg.* 1932, **7,** 791]. Normal sera were absorbed with five different organisms, and each absorbed serum tested against each of the organisms concerned. As in the earlier experiments, it was found that the effect of absorption was a non-specific removal of bactericidal power. When heated normal serum was added to the absorbed sera the bactericidal power against each of the bacteria tested was more or less completely restored. In a further series of tests heated normal serum was absorbed with each organism, and these heated and absorbed sera were tested as regards their capacity to restore bactericidal power to absorbed unheated sera. It was found that this power had been removed, again non-specifically. Although bacteria have thus the power of removing from normal serum some heat-stable constituent that is concerned in bactericidal action, the author was not able to demonstrate any sensitization of living bacteria that had been treated with heated serum and then washed, when they were tested against absorbed unheated serum.

The above experiments were carried out with rabbit and guinea pig sera. Since LOVELL has shown that normal pig sera contain specific somatic agglutinins for bacilli of the Salmonella group, additional experiments were carried out in which normal pig's serum was tested against these organisms. No evidence of the presence of specific bactericidal antibodies could, however, be obtained.

FINKELSTEIN, M. H. (1933). **Further Observations on the Specificity of the Bactericidal Properties of Normal Serum.**—*J. Path. & Bact.* **37.** 359-365. 2 graphs. [11 refs.] [Copied *verbatim* from *Bull. Hyg.* **9.** 201. Signed by W. W. C. TOPLEY].

While none would dispute the occurrence of various specific antibodies in the sera of normal animals, the question as to whether any particular reaction between such " normal " sera and different bacteria is dependent on specific sensitization is a problem that must, in each case, be determined by experimental study. In the particular instance of the normal bactericidins the evidence is, at the moment, conflicting. MACKIE and Finkelstein have recorded absorption experiments that indicate that the bactericidal action of normal serum is due to the action of specific antibodies acting in conjunction with serum-complement [*Bull. Hyg.* 1932, **7.** 248]. GORDON and CARTER have been unable to demonstrate any such selective absorption, and conclude that the bactericidal effect is due to complement acting in conjunction with some non-specific heat-stable factor [*Bull. Hyg.* 1932. **7.** 791].

In the present paper the author records a series of experiments bearing on this discrepancy of evidence. MACKIE and Finkelstein had noted that the washings from certain bacteria were able to inhibit, apparently non-specifically, the bacteri-

cidal action of certain normal sera, and that non-specific absorption of normal bactericidins might be brought about by bacteria that, after thorough washing, showed specific absorption. In the present paper further findings of this kind are recorded, and it is noted that washed bacteria may show a non-specific absorption similar in its range to the inhibitory effect displayed by the washings obtained from them. Even with such bacteria, however, the author has been able to demonstrate specific absorption by allowing the bacteria to react with the serum at 0°C., or by shortening the time of absorption.

GOWEN, J. W., & SCHOTT, R. G. (1933). **A Genetic Technique for Differentiating between Acquired and Genetic Immunity.**—*Amer. J. Hyg.* **18.** 688-694. 2 figs. [Copied *verbatim* from *Bull. Hyg.* **9.** 202. Signed by A. BRADFORD HILL].

In previous experiments two strains of mice have been studied with regard to their susceptibility to *Bact. aertrycke* infection. One, designated the " Sil " strain, suffered 100 per cent. mortality at every test ; the other strain, designated " S " showed some survivors and from these over a course of six generations, each tested in turn, a resistant strain was developed (mortality rate of 24·7 per cent. in the F_6 generation). The problem is whether this development of resistance is derived from genetic factors or from an immunity in the offspring acquired from the infected survivors responsible for the production of each generation. The S and sil strains differ in their genetic factors for coat colour so that it is possible to distinguish between S, sil and hybrids. A sil female mated in the same oestrus period to two males, one sil and one S, may have sil and hybrid progeny in the same litter. Environmental conditions are common to all animals of a litter, each having the same opportunity to receive immune bodies from the mother and to receive latent infections from the parents. Six such double matings were successfully obtained with 21 sil and 15 hybrid progeny. At sixty days of age these were inoculated with the standard dose used in the previous experiments. The resulting death rates were 100 per cent. for the Sil mice and 53·3 per cent. for the hybrids, and in time of death, as well as in proportion of deaths, mice from double matings were found to resemble mice of the same parentage from single matings. The result therefore is in favour of the concentration of genetic factors for resistance rather than the transfer of acquired passive or active immunity.

I. GLOVER, R. E. (1933). **A Study on Tuberculin with Special Reference to the Double Intradermal Test.**—*Third Rep. Direct. Inst. Anim. Path. Univ. Cambridge. 1932-33.* pp. 200-226. 15 tables. [34 refs.]

II. BUXTON, J. B., & GLOVER, R. E. (1933). **Comparative Field Trials of a Synthetic and a Standard Tuberculin.**—*Ibid.* pp. 227-232. 1 table. [1 ref.]

III. BOQUET, A., & NINNI, C. (1933). Sur les propriétés réactionelles des Bacilles tuberculeux aviaires et de leur tuberculine. [**Tuberculin Reactions to the Avian Type of** *Mycobact. tuberculosis*].—*C. R. Soc. Biol. Paris.* **113.** 1047-1050.

IV. VALTIS, J., PAISSEAU, G., & VAN DEINSE, F. (1933). Sur l'allergie comparée à la tuberculine et aux filtrats d'ultravirus tuberculeux. [**A Comparison of the Allergic Reactions to Tuberculin and to the Tuberculous Ultravirus**].—*Ann. Inst. Pasteur.* **51.** 584-590.

I. The intracutaneous reactions of normal and tuberculous cattle to various fractions of tuberculin were studied in an attempt to reduce the non-specific response and thus simplify the interpretation of the double intradermal test. It was found that, in so far as cattle are concerned, the various components of the

medium, viz. glycerine, veal infusion and peptone, when tested separately, were without appreciable effect on the bovine skin, but that in the process of concentration by heat a substance was elaborated which was responsible for the non-specific reaction. This factor could be partially eliminated by purification with ammonium sulphate and was almost completely removed by alcohol and acetone.

Purified tuberculins were obtained by growing the organism in a modified Long's synthetic medium followed by precipitation of the tuberculo-protein with ammonium sulphate. They were not less potent than a " standard " tuberculin in tuberculous subjects, but induced an appreciably smaller reaction in negative animals.

Tuberculinogenic substances were also obtained from the tubercle bacillus itself, but they presented no advantage over ordinary tuberculin.

II. The purified tuberculin, as described above, was compared by the double intradermal method with a standard old tuberculin in herds which were known to be infected. The total number tested was 915 ; 697 were negative to the standard and 703 to the purified tuberculin, while 201 gave positive reactions to both. There were discrepancies between the two in 23 instances. In negative animals, the reactions to the purified tuberculin were uniformly smaller than to the standard.

The question of sensitization to tuberculin is discussed.

III. The allergic and toxic effects of human and bovine strains of *M. tuberculosis* were compared with avian strains in guinea pigs infected with definite doses of the organisms. The guinea pigs were tested intradermally with a killed emulsion of the bacilli or with their corresponding tuberculins, or by the subcutaneous injection of definite doses. The results indicated that avian tubercle bacilli or avian tuberculin induced a very slight skin reaction as compared with the mammalian products and were about 15 times less toxic. These properties afford an additional method of distinguishing the avian from other types.

IV. A series of children was inoculated intradermally with old tuberculin (1:100 dilution) and with a Chamberland L2 filtrate from a young culture of tubercle bacilli heated to 80°C. for one hour. In a small proportion of the cases, no reaction was obtained with the tuberculin, but the response to the filtrate was positive. The authors claim that in some instances they were able to isolate from various products (sputa, urine, blood or cerebrospinal fluid) the ultravirus of the tubercle bacillus either by guinea pig inoculation or on Löwenstein's medium.

—R. E. Glover.

Klimmer, M. (1933). Beitrag zur Feststellung der Rindertuberkulose durch die Augenprobe. **[Contribution to the Diagnosis of Bovine Tuberculosis by the Eye Test]**.—*Deuts. tierärztl. Wschr.* **41.** 5-8.

The author describes the technique of the tuberculin ophthalmic test with the liquid " phymatin " and states that it should only be used on eyes free from inflammation. A muco-purulent exudate, the sign of a positive reaction, may be noted in 18 to 24 hours, or, in doubtful cases, up to 30 hours after application.

In order to eliminate non-specific reactions, Klimmer has introduced a new technique which involves the use of two ointment preparations, " novophymatin " and " anergin." The former is more concentrated than " phymatin " and causes more intense reactions, whilst " anergin " contains the non-specific elements of " novophymatin," but is free from antigen. " Novophymatin " is put into the left eye and " anergin " into the right eye : in positive cases there should be a reaction in the left eye, but not in the right. With this method an interval of only 18 hours or less is necessary for the reading of the result.

—E. Breusch (Leipzig).

DISEASES, GENERAL.

WEHRLE, E. (1933). Etude des principes généraux d'une législation sanitaire. I. La prophylaxie actuelle ; succès et insuccès. [**General Principles of Sanitary Legislation. Actual Prophylaxis : Success and Failure**]. —*Bull. Off. internat. Epiz.* **7.** 29-51. [1 ref.]

LECLAINCHE, E. (1933). Etude des principes généraux d'une législation sanitaire. II. Les possibilités d'une prophylaxie nouvelle. [**General Principles of Sanitary Legislation. Possibilities of a New Prophylaxis**].—*Ibid.* 52-66. [1 ref.]

—. (1933). Les principes généraux d'une législation sanitaire. [**General Principles of Sanitary Legislation**].—*Ibid.* 314-326.

[These three papers, the last of which is a general discussion which was opened by Dr. Wehrle, are dealt with below in the form of a single abstract.—Ed.].

A review has been made of all the contagious diseases of animals past and present, the progress made in their eradication and/or control, and the difficulties in connection therewith. The following suggestions have been made for the uniformity of action in each country :—

ANTHRAX.—The necessity for certificates that all animal products, such as meat and bone meal, skins and hides, have been sterilized before exportation.

RABIES.—The English method should be adopted in every country.

FOOT AND MOUTH DISEASE.—Apparently the virus can be conveyed in meat. The immunity from serum inoculation is of short duration but serves a useful purpose in treating animals prior to being sent to shows. It has also been efficacious in outbreaks of the disease. Caustic soda solution seems to be the best disinfectant.

SHEEP SCAB.—Sulphur dioxide gas is the best treatment, but it is difficult to apply and not free from danger. Lime-sulphur dip or as an ointment is recommended.

SWINE FEVER.—The disease is generally due to the introduction of new stock, attending shows and sending sows to boars. Quarantine of new stock, especially young pigs, should be applied for at least four weeks.

TUBERCULOSIS.—In Denmark a certain sum is set aside annually for indemnity, suspects are tested, reactors marked and they can only be sold to butchers. A register is kept of herds declared free from reactors. Pigs are tested and reactors are not kept for breeding purposes.

The figures given in connection with eradication of the disease in the United States of America show the percentage of reactors in 1918 as 4·9 and in 1930 as 1·7. In 1929, 2,300,000 cattle were certified free from the disease in 179,723 herds.

JOHNE'S DISEASE.—This disease seems to be most common in Great Britain or else more attention is paid to it. In Württemburg compensation is paid when animals are killed, premises are disinfected, tests with johnin and smears from the rectum are made. Vaccination has been tried and found ineffective.

BORNA DISEASE.—This disease is not common but it exists in Germany, especially in Württemburg, Hesse, Saxony and Prussia. Incurable cases are slaughtered.

EQUINE PERNICIOUS ANAEMIA.—This has been observed in Württemburg, Prussia and Saxony. Infected animals should be isolated indoors and not allowed to graze in pastures ; the blood should be examined every four weeks and the temperature taken ; measures should be taken for disinfection ; and if no cure has been effected after six months, or if on early diagnosis an animal is considered as incurable, it should be slaughtered and the hide disinfected. Vaccination has been tried in France by using spleen pulp from animals killed at the height of the disease.

RINDERPEST, CONTAGIOUS BOVINE PLEURO-PNEUMONIA AND DOURINE.—Rinderpest has been extinct in Germany since 1879, and contagious bovine pleuro-pneumonia and dourine since 1926.

GLANDERS.—This disease is now being eradicated all over the world.

Diseases at present giving much concern to veterinarians are *Br. abortus* infection, mastitis, *Bact. pullorum* infection and bovine haemorrhagic septicaemia.

For control and eradication of all contagious diseases it is necessary to continue with old methods which have proved efficacious and also to adopt new methods where the old have proved ineffective.

Theoretically, two methods must always be kept in mind :—(1) where possible, slaughter of infected cases when the outbreaks first occur, followed by disinfection and (2) the establishment of healthy stock and an endeavour to keep them healthy.

Prevention of disease should be the aim of all concerned. It is as necessary to watch for the outbreak of a disease as to prevent its spread after an outbreak.

—T. DUNLOP YOUNG.

PIRANI, A. (1933). Nuovo contributo alla conoscenza delle infezioni del bestiame in Eritrea. (Coccidiosi dei polli—Colera dei polli—Spirillosi degli agazen—Cenuro cerebrale—Afta epizootica). [**Infectious Diseases of Animals in Eritrea. (Fowl Coccidiosis—Fowl Cholera—Spirilla in a Gazelle—Cerebral Coenurosis—Foot and Mouth Disease)**].—*Clin. Vet.Milan.* **56.** 341-348. 1 fig.

Coccidiosis in Eritrea is caused by *Coccidium* [*Eimeria*] *tenellum* and is of frequent occurrence.

Although it is a prevailing opinion amongst poultry breeders that fowl cholera exists in Eritrea, all suspected cases examined at the serum-vaccine laboratory gave negative results.

Numerous spirilla were found in the blood of a gazelle which died in the stables of the laboratory some days after the arrival from Abyssinia of horses which were infected with spirilla. Ticks (*Rhipicephalus pulchellus*) from infected horses may have carried the infection to the gazelle.

Cerebral coenurosis in cattle was observed. Foot and mouth disease in cattle is rare ; it is not of a severe nature and recovery always occurs.

—F. VEGLIA (TURIN).

FENSTERMACHER, R., & JELLISON, W. L. (1933). **Diseases Affecting Moose.**—*Univ. Minn. Agric. Expt. Sta. Bull.* No. 294. pp. 20. 6 figs., 2 tables. [12 refs.]

Records kept in Minnesota indicate that a disease occurs in the moose which causes general weakness, staggering gait, intermittent blindness and a complete loss of the animal's natural shyness of man. Owing to natural conditions it is not possible at present to estimate the prevalence of the disease, but the authors have examined cases, as opportunity occurred, since 1924. Several affected moose have been studied haematologically and for parasites and bacteria. No specific causal agent has been found, but an almost constant parasite was the tick *Dermacentor albipictus* Packard ; a number of experiments with these ticks, however, have failed to reveal their significance in the disease.—NORMAN HOLE.

TURBET, C. R. (1933). **Bulbar Paralysis in a Bull in Quarantine.**—*Agric. J. Fiji.* **6.** 16-18. 1 plate. [1 ref.]

This condition, due to forage poisoning [botulism], occurred in an imported bull and is the first recorded case in Fiji. The symptoms were abstinence from

food and water, incoordinated movement with slight staggering gait, swaying of the hind quarters, constant protrusion of the tongue, dripping of saliva, weak respiratory movements, scurfiness of the skin and the occurrence in the pharynx of an impacted wad of food. [This is said to be an almost constant symptom of bulbar paralysis and is almost diagnostic]. The temperature was normal. After being under observation for 11 days the bull was destroyed. Chaff consumed during the voyage from Sydney was considered to be the source of infection.

—C. R. TURBET.

FRAUCHIGER, E. (1933). Ueber Rückenmarksdiagnostik bei Mensch und Pferd. [**Diagnosis of Spinal Cord Diseases in Man and Animals**].—*Schweiz. Arch. Tierhlk.* **75.** 414-431. 2 figs.

This is a review of the methods available for special diagnosis of diseases of the spinal cord and for the examination of cerebrospinal fluid.

The uses of lumbar puncture and of the alternative suboccipital puncture in the examination of cerebrospinal fluid, both as to its composition and pressure, are described. Reference is also made to X-ray diagnosis, combined with the lipiodol method. These methods are not of frequent use for animals, but might be employed with advantage in certain cases. For horses the author suggests that the suboccipital puncture is preferable to lumbar puncture on anatomical grounds [see also EDWARDS, J. T. (1926). *J. Comp. Path. & Therap.* **39.** 83]. The physiology and pathology of the spinal cord in man and animals is outlined, and reference is made to some spinal diseases in animals, e.g., ossifying pachymeningitis in dogs, chronic ankylosing spondylitis in horses and dogs, intervertebral (outgrowths from the cartilages) enchondrosis in dogs and intervertebral enostosis in horses.—J. E.

BERTHELON, M. (1933). Etio-pathogénie et prophylaxie des ostéo-arthropathies des petits Ruminants. [**Aetiopathology and Prophylaxis of Osteo-Arthritis in Small Ruminants**].—*Rec. Méd. vét.* **109.** 257-268. [14 refs.]

This is a review of the joint affections of the sheep and goat. The author briefly considers joint troubles resulting from protein or mineral salt intoxications and then passes to the more important osteo-arthritis of microbial origin. Inflammations of the joints may be secondary to mammitis, metritis, pharyngitis, etc., but some organisms, such as those of contagious agalactia and swine erysipelas, and *Br. melitensis* (adult animals), exhibit a predilection for the joints. Pyogenic streptococci, staphylococci, *Clostridium pyogenes*, *Cl. welchii*, the bacillus of lamb dysentery, more rarely *Actinomyces necrophorus*, the actinobacillus, and *Bact. coli* are also considered to be occasional causative agents. The methods of infection, of prophylaxis, and of treatment are considered; the conditions and mode of infection may influence the success of one treatment where another has failed.

—NORMAN HOLE.

REMLINGER, P., & BAILLY, J. (1933). La mort rapide des souris, des rats, des cobayes, des lapins, etc., exposés au soleil. [**Rapid Death of Mice, Rats, Guinea Pigs, Rabbits, etc., Exposed to the Sun**].—*Maroc-Méd.* April 15th. 243-248. [4 refs.]

In this paper the authors discuss the various factors which might account for the extreme susceptibility of rodents to the sun's rays. It was their experience that if rodents were left in the sun for as short a period as half an hour they would be found dead.

The problem proved to be very complex and the authors conclude by saying that the susceptibility of rodents is probably due to their habitual sheltered

existence. Regarding the way in which the sun exerts its lethal action, it is stated that, whereas it is very likely due chiefly to thermic rays, it is probable that the thermic, luminous and actinic rays all play a part.—GWILYM O. DAVIES.

VELU, H., & ZOTTNER, G. (1933). Lumière et Infection. [**Light and Infection**]. —*Maroc-Méd.* July 15th. 379. [4 refs.]

The authors comment on the paper by REMLINGER and BAILLY [this *Bull.* **4.** 480.] and report cases of death in rats exposed in cages to diffuse daylight. The rats were being used at the time for experiments on fluorine poisoning, but death was not due to that factor.

They also report the death of a number of pigeons in an experiment on immunization against fowl cholera. The pigeons were inadvertently left in the Moroccan sun and died as the result : lesions of fowl cholera were present and the bacilli were demonstrated. A similar lot placed in the shade did not die. [The deaths in the pigeons can be explained by simple sunstroke or heatstroke and are not analogous to the rat cases].—J. E.

KREDIET, G. (1933). Over buiklongen. [**Abdominal Lungs**].—*Tijdschr. Diergeneesk.* **60.** 745-751. 3 figs. [Summaries in English, French and German : abst. from orig.]

When delivering a cow, great trouble was experienced from ascites and a tumour-like mass in the abdomen of the calf. This mass weighed about 10 kg., lay by itself in the abdomen and appeared to consist of pulmonary tissue. A second case of pulmo accessorius abdominalis was found when slaughtering a new-born calf, in this instance the mass being connected with the diaphragm by a thin stem. Microscopically the structure was almost like that of a normal lung. This is explained by supposing that a part of the lungs entered the abdomen through the diaphragm before it was closed and, at the closing of the latter, was cut off. This supposition may be corroborated by the fact that in the second instance a ramified bronchus ran all through the abdominal lung, starting at the diaphragm. —J. VAN DER HOEDEN (UTRECHT).

PUBLIC HEALTH.

I. GAIGER, S. H., & DAVIES, G. O. (1933). **Bovine Tuberculosis : Biological Tests of Milk.**—*Vet. Rec.* **13.** 874-876. 2 tables.

II. GAIGER, S. H., & DAVIES, G. O. (1933). **Excretion of** *Mycobacterium tuberculosis* **in the Milk of a Cow with an apparently Normal Udder.**—*Ibid.* 900-901.

I. The writers previously [(1931). *Vet. Rec.* **11.** 1072.] recorded the results of biological tests of 1,435 samples of milk received from one county in England during the 12 months period to June, 1931. Since their results were published a further 2,775 samples of milk have been examined in the two-year period ending June, 1933. Tables are given showing the nature of the samples, the number examined in each category, and the number of positives. Of the 2,755 samples, 286 proved positive for tuberculosis, 213 of which were *mixed direct* samples, that is, samples containing some of the milk from each cow in a herd.

One of the objections raised against the biological test is that a period of six weeks or more may elapse before a diagnosis can be made. It is interesting, therefore, to note the times taken in reporting upon the 286 positive samples.

Thus positive diagnosis was returned in connection with three samples during the second week, 30 samples during the third week, 85 samples during the fourth week, 43 samples during the fifth week, and 125 samples during the sixth week. Among the 286 positive samples, in 21 instances one of a pair of guinea pigs failed to become infected. This represents 7·3 per cent. of the positives but less than 1 per cent. of the 2,755 samples examined. In 51 instances one guinea pig of a pair died prematurely. Among the 2,755 samples of milk examined, in 105 instances both guinea pigs died prior to the sixth week ; and of the 105 samples, in 32 instances both the guinea pigs were dead within two weeks of inoculation. The loss of a result in this way means not only the loss of the cost of collecting the sample and carrying out the test, but leaves the authority in doubt. A further sample has to be taken involving further labour and expense. Great care has to be taken in the collection and treatment of stocks of guinea pigs. In addition there is the danger of contaminating organisms in the inoculum, which is almost unavoidable. It is recalled that MINETT found in a cultural examination of 16 herds that 39 per cent. of the cows were carriers of the streptococcus of mastitis.

II. From time to time cases have been recorded of cows which have been found to be excreting the tubercle bacterium in their milk without *ante* or *post-mortem* evidence of tuberculous lesions of the mammary gland. A case is now recorded which is of special interest in that the cow concerned was shown to have been passing tubercle bacteria from an apparently normal udder for a period of about six months.

The cow having been slaughtered, extensive caseating lesions of tuberculosis were found in the lung. The mesenteric glands were tuberculous, and one kidney showed tuberculous lesions. No lesions were found macroscopically either in the udder or supramammary lymphatic glands, but a block of supramammary glands, when sectioned and examined microscopically, revealed tuberculous lesions in which, however, no acid-fast organisms could be found. Pieces of udder tissue were tested biologically and inoculated guinea pigs killed at the end of nearly three months were found free from tuberculosis ; but two guinea pigs inoculated with a suspension of supramammary glands developed lesions within six weeks. It is pointed out, however, that one cannot rule out the possibility or the probability of the presence of undetectable microscopic lesions in the udder tissue.

—LL. E. W. BEVAN.

BROWNLIE, J. L. (1933). **Tuberculous Infection in Milk. A Report by the Department of Health for Scotland.**—*Med. Res. Council. Gt. Britain. Spec. Rep. Ser.* No. 189. pp. 38. London : H.M. Stat. Off. [9d.] [Copied *verbatim* from *Bull. Hyg.* **9.** 198-199. Signed by W. G. SAVAGE].

One of the most valuable features of the report is the fact that great attention was paid to the standardization of methods and the employment of a similar technique. Only some of the main conclusions can be indicated. With 1,534 samples of raw milk consigned from farms to the four large cities the percentage positive for the tubercle bacillus was 10·0, the different city figures being Aberdeen 9·9, Dundee 6·5, Edinburgh 11·6 and Glasgow 13·4. The figures dissected in relation to the volume of milk actually examined show that the greater the bulking of milk the higher the incidence of positive tubercle bacillus cases. This is particularly evident with raw milk consigned in tanks, with wide variations in volume but with an average of 509 gallons per sample, as of 207 samples 74 were positive (37·5 per cent.). Dissected into various volumes the incidence increased from 14·0 per cent. positive in the under 200 gallons sample to 37·1 per cent. in the 200-400 gallons to 50 per cent. positive in samples from tanks of over 400 gallons

capacity. Of " certified " milk samples all 329 were negative and of 385 " Grade A (T.T.)" 384 were negative, excluding a few inconclusive results for each group.

Of heat-treated milks 291 were " flash " pasteurized with 8·2 per cent. positive, while of 1,243 " holder " pasteurized 2·8 per cent. were positive. These samples include those under licence and those not regulated by licence. The authors make the important point that as any form of heat treatment implies bulking these figures must be compared with the tank bulk results, i.e., with 37·5 per cent. positive and show that both heat treatment methods, even when uncontrolled, do materially reduce the positive infection results. Results are also dissected as regards eight different types of plants with the interesting findings that positive results were obtained with four and all negative results with the other four ; two types of plant being the main offenders. The factors operating are in part discussed.

A further series comprised 1,494 samples of milk as retailed with 9·91 per cent. positive ; Aberdeen being 8·31, Dundee 7·37, Edinburgh 14·33 and Glasgow 10·58 per cent. positive. These differences are not very illuminating since the proportions heat treated varied materially in the different cities. These proportions are analysed as well as the relative volumes heat treated and the conclusion is that the general rate of infection of the total quantity of milk retailed in the four cities is considerably lower than 10 per cent. and probably little more than 5 per cent. This is largely because the proportion of infected samples is so materially lower in the heat treated than in the untreated milks.

A feature of the technique is the use of two guinea pigs one usually killed after 4, the other after 8 weeks. In brief the results show that over one-third of the positive cases would have been missed if only one guinea pig had been used, killed after 4 weeks. This is particularly applicable to the heat treated samples, the proportion being substantially higher with the two guinea pig technique for these milk samples.

—. (1933). **Bacterial Content of the London Milk Supply.**—*Med. Officer.* **50.** 202-204. [Copied *verbatim* from *Bull. Hyg.* **9.** 198. Signed by W. G. Savage].

An important report into the condition of milk as it reaches London. A material proportion (about 40 per cent.) of the milk arrives in glass lined tanks each holding some 3,000 gallons. The first examination of ten road and rail tanks showed that all contained living virulent tubercle bacilli. Later 18 tanks were examined of which 15 contained tubercle bacilli (83 per cent.). Of these 15 positive cases 7 were positive with amounts equivalent to 50 cc. of milk but negative with smaller quantities ; 5 were positive with the equivalent of 5 cc. of milk 3 were positive with the equivalent of 0·5 cc. of milk. While the bulking spreads the infection it cannot be said to what extent it diminishes the risk. From the estimates of *Bact. coli* and number of organisms the milks showed heavy contamination. Practically all the tank milk comes to the big dairy firms who pasteurize it on its receipt in London. Most of it is pasteurization by holder methods but not under official control and designation. The difficulty of tracing the source of tubercle bacilli in such milks is discussed and the difficulties are largely insurmountable. Various methods to prevent infection are discussed.

I. Münchberg, F. (1933). Die hygienische Beurteilung pasteurisierter Milch. [**The Hygienic Estimation of Pasteurized Milk**].—*Wien. tierärztl. Mschr.* **20.** 278-284. 3 tables. [20 refs.]

II. Gorini, C. (1933). Azidoproteolyten und thermophile Bakterien bei der Pasteurisierung der Milch. [**The Acidoproteolytic and Thermophilic Organisms in the Pasteurization of Milk**].—*Zlb. Bakt. I.* (*Orig.*). **127.** 357-360. [6 refs.]

I. The author gives a series of figures showing the results of bacteriological, fermentation and chemical examinations of samples of pasteurized milk. The value of the different tests is discussed and the following are conclusions drawn :—

If there is no veterinary inspection of the dairy herd the pasteurizing plant must be very carefully watched. The time and the temperature to which milk has been heated must be controlled by means of an automatic thermograph. The efficiency of the pasteurization should be checked by bacteriological and chemical tests. The precautions taken to prevent outside contamination of the pasteurized milk should be watched. There is a certain relation between the *Bact. coli* titre and the contamination test. The lactose-brom-thymol-blue-trypaflavin agar of Klimmer, Haupt and Borchers proved to be very useful for the *Bact. coli* count. The importance of the count of the alkali-forming organisms and the estimation of the residual nitrogen in methanol serum is emphasized. The peroxydase test of Ilzhöfer combined with the Rothenfusser diastase test proved very useful for the estimation of the temperature to which the milk had been heated. As additional proof, the Schern-Gorli ring test and the rennet-serum method of Hock modified by Kohn and Klemm can be used.

II. Gorini refers to his descriptions of the acidoproteolytic and thermophilic organisms of the milk in 1892 and 1894. In the present paper he points out the importance of these organisms in spoiling pasteurized milk.

The acidoproteolytic bacteria are able to produce a sweet or premature coagulation of the milk by means of a ferment ; by the action of the same ferment the bacteria are surrounded by a casein pellicle which to a certain degree renders them heat-resistant. The thermophilic organisms are not only heat-resistant but even multiply at high temperatures so that there is a higher count after treatment than before. The author emphasizes that the judgment of milk should not depend upon the bacterial count but upon the differentiation of those groups of bacteria that survive pasteurization and cause subsequent changes in the milk.

—R. Wetzel (Hanover).

I. Niemczycki, S. (1933). Oznaczanie liczby bakteryj w mleku metoda Skar'a. [**Bacteriological Control of Milk by Skar's Method**].—*Przeglad Wet.* **46.** 187-192. 7 figs. [6 refs.]

II. Ber, A. (1933). Badanie mleka rynkowego warszawskiego na obecnosć paleczek Banga i pratków gruzliczych. [**Examination of Milk from the Warsaw Market for the Presence of** *Br. abortus* **and** *Mycobact. tuberculosis*]. —*Wiadom. wet.* **12.** 241-252. 4 tables. [7 refs.] [Summary in French : abst. from orig.]

I. For immediate bacteriological control of milk the author recommends Skar's method and describes the technique.

II. 24·8 per cent. of samples of Warsaw market milk were found to be infected with *Br. abortus* and *M. tuberculosis*. Agglutination reactions of the mixed milk whey at a dilution of 1 : 4 should be regarded as positive. Guinea pigs were inoculated with the sediment and cream from at least 20 c.c. milk. The contamination of the milk with accidental organisms was so great that all the animals inoculated with the sediment and cream died between the first and the fifth days. Guinea pig inoculations revealed the presence of *M. tuberculosis* of the bovine type in 19·4 per cent. of examined samples and 8·1 per cent. of samples showed a mixed

infection, i.e. an infection with *Br. abortus* and *M. tuberculosis*. *Br. abortus* was demonstrated in milk between the 18th and the 49th days after abortion.

—K. Szczudlowski (Lwów).

I. —. (1933). **The Prophylaxis of Milk-Borne Disease.**—*Lancet.* **225.** 240-241.
II. Wilson, G. S. (1933). **The Necessity for a Safe Milk-Supply.**—*Ibid.* 829-832. 1 table. [12 refs.]

I. This article summarizes a discussion at the International Paediatric Congress, 1933. Speakers of many nationalities discussed the advantages and disadvantages of feeding with raw, evaporated, pasteurized and boiled milk with particular reference to the dangers of tuberculosis, infantile paralysis and vitamin deficiency diseases.

II. This article gives the substance of a paper read before the Agricultural Section of the British Association at Leicester on September 12th, 1933. "Clean" milk can be obtained by practising a few simple hygienic precautions but "safe" milk can only be obtained by heat treatment. Milk may be rendered "unsafe" by organisms gaining access to the milk from the cow's udder or by the introduction of infection from human sources. Even if tuberculous mastitis in cattle could be eliminated, the author still thinks that pasteurization is desirable as a safeguard against infection from the milk personnel. He proposes that all milk should be subject to compulsory grading and that large urban authorities should have compulsory pasteurization powers. In order, however, to stimulate clean milk production a prepasteurization standard should be laid down and only milk conforming to this standard should be pasteurized.—Gwilym O. Davies.

Willfuhr, Fromme, & Bruns, H. (1933). Nahrungsmittelkrankungen durch Enteneier. [**Food Poisoning associated with Ducks' Eggs**].—*Veröffentl. Gebiete Med.-verwalt. Berlin.* **39.** No. 3. pp. 1-25. [18 refs.]

The authors record 25 outbreaks of human food-poisoning associated with ducks' eggs. Of 143 patients, two died and, from the faeces of 99, salmonella bacteria (*Bact. enteritidis* and *Bact. aertrycke*) were isolated. The eggs were added to the incriminated food and in six of the outbreaks the eggs were preserved ones. A bacteriological examination of 81 similar eggs failed to reveal the presence of any member of the food-poisoning group of bacteria. Experiments were carried out, in which both ducks and pigeons were injected with, and fed with, food-poisoning bacteria and similar bacteria were isolated from the outside of the shells of eggs laid by diseased birds. The authors then quote the findings of another worker who had isolated salmonella bacteria from the insides of eggs. A warning is issued as to the potential danger of the use of fresh ducks' eggs. [*Bact. enteritidis* and *Bact. aertrycke* have been isolated from ducks' eggs in this country by Scott and by Dalling & Warrack (1932). *J. Path.* & *Bact.* **35.** 655].—R. Lovell.

Prod'homme, C. (1932). Le Vétérinaire Inspecteur des Viandes et l'Arrêté Ministériel du 11 Février 1909. [**The Veterinary Meat Inspector and the Law of February 11th, 1909**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 49. [42 refs.]

The introduction points out the dangers of transmitting bovine tuberculosis to man and gives the estimates formed by various savants as to the percentage of bovines affected with the disease, varying from Nocard (1892), 5 per cent.; Moussu, 32 per cent.; Guérin, 40 per cent. in house-fed animals, and the Department of the Seine, 1904 to 1925, 32·74 per cent. He also quotes the English Commission on Tuberculosis, 1922, in which it was stated that 87·5 per cent. of tuberculous lymph glands in

children under five years of age were due to bovine tuberculosis and that, according to CALMETTE, the bacilli can traverse the intestinal mucosa without causing lesions.

He deals next with French laws relating to meat inspection and gives a brief history of meat inspection in France, stating that the population of Paris has risen in seven centuries from 300,000 to more than 4,000,000 and the numbers of animals killed annually have increased enormously. In the different towns throughout France inspection is conducted under municipal administration approved by the prefects. It appears that, as early as 1350, an edict was prescribed dealing with meat inspection in that country. The views held by various savants as to partial or total condemnation are given. The freibank system and the stamping of certain meats as " inferior quality " are discussed.

To those who are interested in comparing the present with the past views on partial or total seizure of carcasses in which lesions of tuberculosis are found, the thesis is well worthy of perusal.—T. DUNLOP YOUNG.

THERAPEUTICS.

BIRKHAUG, K. E. (1933). **Phenyl-Mercuric-Nitrate.**—*J. Infect. Dis.* **53.** 250-261. 5 tables. [6 refs.]

The author tested the antiseptic and disinfectant powers of phenyl-mercuric-nitrate by the Reddish phenol-coefficient method, comparing it with merthiolate, metaphen, mercurochrome, mercuric chloride and tincture of iodine for bactericidal action on cultures of five bacteria pathogenic to human beings. He used mice, rabbits, dogs and himself to test its toxicity, estimated its concentration in the body fluids after enteral and parenteral injection and tested its efficiency as a disinfectant for skin. The first part of the test showed phenyl-mercuric-nitrate to be greatly superior to the other antiseptics ; in addition, it remains stable at room or incubator temperature, is not haemolytic, does not precipitate tissue protein and does not corrode steel.

The toxicity of the saturated (0·067 per cent.) aqueous solution was found to be very low, no less than 15 c.c. per kg. being required to injure rabbits (intravenous or intraperitoneal injection). In very large doses, larger than would ever be used medicinally, the drug is nephrotropic, injuring the convoluted tubules.

Samples of urine, bile, blood serum and cerebrospinal fluid, some from rabbits, some from dogs previously dosed, were tested for bactericidal action *in vitro* and were found to be markedly potent in this respect, even when diluted.

Finally, skin disinfection trials were carried out on artificially infected rabbit skin and ordinary unwashed human skin, with the result that phenyl-mercuric-nitrate, as an alcohol-acetone-aqueous 0·034 per cent. solution, was found very efficient and far superior to tincture of iodine, metaphen or mercurochrome.

The results of the numerous tests are given in tables and discussed in the text.

[This drug evidently marks a great step forward in disinfection and antisepsis].

—J. E.

I. SEN, S. K. (1933). **The Curative Treatment of Surra** (*Trypanosoma evansi* **Infection) in Equines by Means of " Bayer 205" (Naganol).**—*Ind. J. Sci. & Anim. Husb.* **3.** 85-102. 2 tables. [15 refs.]

II. CORDIER, G., & MENAGER, J. (1933). De l'emploi du naganol dans le traitement préventif de la dourine chez les baudets étalons. [**Use of Naganol in Preventive Treatment against Dourine in Donkey Stallions**].—*Bull. Soc. Path. exot.* **26.** 784-788. [4 refs.]

III. CARMICHAEL, J. (1933). **A Note on the Treatment of Trypanosomiasis in Dogs in Uganda.**—*Vet. Rec.* **13.** 886-887.

I. Sen discusses the records of combined intrathecal and intravenous injection of " Bayer 205 " in equine surra and of simple intravenous injection and concludes that a single intravenous injection of 5 to 8 g. per 1,000 lb. body weight is usually capable of effecting a cure under field conditions in India, whilst the combined method, with its three courses of injections and the need for skilled assistance, is impracticable if large numbers of animals require treatment.

II. This paper records vaso-dilatation, oedema, skin eruptions, incoordination of movement and paralysis as the result of intravenous injection of doses of " Bayer 205," varying from 2 g. to 5 g., into donkeys weighing from 300 and 350 kg. One animal inoculated with dourine from a rabbit three months and ten days after injections of " Bayer 205," although showing no symptoms of disease, proved infective on subinoculation of blood into a rabbit.

III. This article discusses the differentiation and treatment of *Tryp. brucei* and *T. congolense* infections in the dog. The former is more acute and is characterized by interstitial keratitis which does not occur with *T. congolense* infection.

For *T. brucei* infection " Bayer 205 " is recommended, given intravenously or intraperitoneally in a dose of approximately 0·015 g. per lb. body weight and repeated on the third and tenth days. In four experimental cases, subinoculation into guinea pigs at varying periods after completion of treatment failed to cause an infection.

For *T. congolense*, tartar emetic in doses of from 0·5 to 1·5 grains or antimosan in a dose of 0·25 c.c. per lb. body weight is recommended. In both cases, the drug is given intravenously and is repeated daily for four successive days. A watch must be kept for relapses.—U. F. RICHARDSON.

I. BUSCH, G. (1933). Praktische Versuche zur Desinfektion von Eisenbahnviehwagen mit Natronlauge, Kresolschwefelsäure und Sulfoliquid unter Verwendung von Paratyphusbakterien, Rotlaufbazillen und Drusestreptokokken. [**Disinfection Test of Railway Wagons with Caustic Soda, Cresol-Sulphuric Acid and Sulpholiquid using Paratyphoid, Swine Erysipelas and Strangles Bacteria**].—*Tierärztl. Rdsch.* **39.** 579-580. 1 table.

II. HELM, R. (1933). Desinfektionsversuche in mit Wild- und Rinderseuche infizierten Eisenbahnviehwagen. Zugleich ein Beitrag zur Biologie des Erregers dieser Seuche. [**Disinfection Trials of Haemorrhagic Septicaemia Infected Cattle Trucks**].—*Arch. wiss. prakt. Tierhlk.* **66.** 505-511. 2 tables.

I. Wooden boards were soaked for 15 hours in a watery dilution of horse and pig faeces previously infected by the addition of cultures of paratyphoid bacteria, swine erysipelas bacilli or strangles streptococci. They were then fastened to the floor or walls of cattle trucks for test. Before applying the disinfectant solutions, pieces of wood were cut out and examined in order to verify the presence of live bacteria of the species named. In some cases the wagons were washed out with hot soda solution before the application of the disinfectants under test—caustic soda, cresol-sulphuric acid and sulpholiquid. After intervals of 1, 2, 4, 6, 8 and, in a few cases, 24 hours, further pieces of wood were cut out and tested by culture for infectivity. The results are given in a table showing the time in hours required by various disinfectant concentrations to kill the bacteria.

Cresol-sulphuric acid (3 per cent.) was effective, and killed all three bacterial species within six hours ; caustic soda (1 or 2 per cent.) was more rapid in action and 5 to 20 per cent. sulpholiquid was relatively ineffective, requiring ten hours' action in many cases and failing to kill in many more.

The temperature and humidity of the atmosphere appeared to have no influence upon the results.

The author recommends caustic soda (2 per cent.) as a reliable disinfectant for cattle trucks.

II. A different system of experiment was used by Helm. Cattle and pigs respectively were each artificially infected with a pasteurella isolated from a fatal case in its own species ; six bovines and six pigs were then placed in equal lots in two cattle trucks where they died within a few days. Cultural tests were carried out to confirm the specific cause of death ; the animals were removed and at different times one wagon was cleaned and disinfected according to regulations with either caustic soda (2 per cent.) with or without 5 per cent. of lime added, or with cresol-sulphuric acid (3 per cent.), left for one to five hours and then a fresh lot of cattle and pigs were placed in both wagons, the other serving as a control and left without being either cleaned or disinfected. The efficiency of the disinfectants was judged by the fate of the animals. Ten such tests were carried out and the results indicated that 2 per cent. caustic soda does not kill *P. bovis* nor *P. suis* in four hours, but that 3 per cent. cresol-sulphuric acid disinfects in two hours at any temperature likely to be encountered.—J. E.

HENSCHIEN, J. (1933). Om behandling av brunstmangel med " Prolan." [**Prolan Treatment of Anoestrum**].—*Norsk Vet.-tidsskr.* **45.** 492-497.

An account of the treatment with " prolan " of anoestrum in 16 cows and two sows, eight of the cows being treated by Lugol's iodine irrigations for concurrent endometritis.

Heat appeared, on an average, 11 days after treatment and all the cases which the author had occasion to examine later, namely, nine of the cows, became pregnant.—L. SLAGSVOLD (OSLO).

TECHNIQUE.

HARDT, O. (1933). Nogle Undersøgelser over Blodlegemernes Saenkningshastighed hos Svin. [**Blood Sedimentation Rate in the Pig**].—*Maanedsskr. Dyrl.* **45.** 171-189. 3 figs., 6 tables. [23 refs.]

The author employed a micro-method described by LOTTRUP, in which sedimentation tubes with an internal diameter of 3 mm. and a blood column height of 200 mm. are used. The blood was obtained when the pigs were killed and the necessary amount of sodium citrate was added at once. The average sedimentation figures expressed in mm. for 75 apparently normal pigs were as follows:—1 hour, 2·61 ; 2 hours, 6·36 ; 3 hours, 10·58 ; 4 hours, 12·77 ; 5 hours, 19·54 ; 6 hours, 22·81 ; 7 hours, 28·82 ; 17 hours, 43·72 and 24 hours, 50·46. After 24 hours hardly any additional sedimentation was observed. In cases of disorders of the lungs, dermatitis, etc., an increased sedimentation rate was observed. The difference between the latter cases and apparently normal animals was perceptible after two to three hours.—H. C. BENDIXEN (COPENHAGEN).

ALPER, T., & STERNE, M. (1933). **The Measurement of the Opacity of Bacterial Cultures with a Photo-Electric Cell.**—*J. Hyg. Cambridge.* **33.** 497-509. 6 figs. [Copied *verbatim* from *Bull. Hyg.* **9.** 202. Signed by W. W. C. TOPLEY].

Using a photo-electric cell the authors have measured the opacity of cultures of *Bact. gallinarum* at various stages of growth, and compared these opacity

readings with the total number of bacteria per cc. of culture at each stage. Their results during the first eight hours of growth are in close accord with those reported by WILSON. Young actively growing bacilli produce, number for number, a far greater opacity than bacilli that have passed the logarithmic phase of growth. Thus a particular degree of opacity was produced by 178 million bacilli per cc. after 4-7 hours' growth, by 246 million bacilli after 5-8 hours' growth, and by 646 million bacilli after 8-7 hours' growth.

GORESLINE, H. E. (1933). **A Pipette Electrode for the Determination of pH in Biological Fluids.**—*J. Bact.* **25.** 435-438. 1 fig. [4 refs.]

Describes a method of determining the pH of fluids when only small quantities are available.—R. G. LINTON.

LEGENDRE, R. (1933). Un nouveau colorimètre. [**A New Colorimeter**].—*C. R. Soc. Biol. Paris.* **113.** 1031-1034. 1 fig. [2 refs.]

This paper describes an instrument devised for use with liquids which may be turbid or coloured. The variation of intensity of the colour is obtained by placing the indicator in a prismatic vessel in the path of the beam. When this is moved laterally by means of a graduated screw the light has to pass through a varying depth of liquid.—R. G. LINTON.

I. OEHMKE. (1933). Fangschirmchen (Schirmfänger) zur Entnahme von Bronchienschleim bei tuberkuloseverdächtigen Rindern. [**Bronchial Mucus Collector for Tuberculous Cattle**].—*Tierärztl. Rdsch.* **39.** 643-644. 1 fig.

II. OEHMKE. (1933). Atmungshemmer für die Untersuchung tuberkuloseverdächtiger Rinder. [**Nostril Stoppers for Tuberculosis Diagnosis in Cattle**].—*Ibid.* 765.

III. KARSTEN. (1933). Vergleichsuntersuchungen zwischen den mit der Trachealkanüle und den mit dem Trachealrohr nach Frisch entnommenen Bronchialschleimproben. [**Comparison between the Tracheal Tube and Canula for the Collection of Bronchial Mucus**].—*Deuts. tierärztl. Wschr.* **41.** 577-578.

IV. SCHARR. (1933). Die Verwendung einer einheitlichen Kanüle. [**Use of a Uniform (Tracheal) Canula**].—*Ibid.* 578-579.

I. This article describes an improved apparatus for obtaining samples of bronchial mucus from cattle. It consists of a pliable wire carrying a wad of gauze at the end and an umbrella-like ruff just above. The apparatus can be inserted through a peroral or tracheal canula and the ruff is said to facilitate the collection of a good sample of mucus by causing the animal to cough ; it also prevents, to some extent, the scraping off of the mucus during the withdrawal of the wire.

II. An illustrated note describing a new model of nostril-occluder used in Germany in the diagnosis of bovine pulmonary tuberculosis : it operates by compelling the animal to cough.

III. Karsten gives the results of comparative lung mucus tests on 35 tuberculous cattle carried out by FRISCH (since deceased) with the latter's design of canula for peroral use [this *Bull.* **3.** 324.] and the ordinary tracheal canula.

A larger mucus sample was obtainable with the former, the mucus was never bloodstained, as it sometimes is with the latter method, and the microscopic and cultural results were about equal with both types of canula. In addition, the tracheal tube of FRISCH is more easily disinfected. SCHUMANN, in a discussion, gave the results of similar comparative tests on 17 cattle, 11 of which were found to be tuberculous. The Frisch canula failed to show a positive result in four of these

cases diagnosed as positive by the guinea pig test using the tracheal canula. [No conclusive judgment of the merits of these instruments can be drawn from these few results : both are very useful].

IV. This is essentially the same as a paper published elsewhere [this *Bull.* **4.** 137]. When numerous cattle are to be examined, Scharr advocates the use of a separate canula for each animal, to eliminate errors from inefficient cleansing, but the more expensive trocar need not be made in such large numbers as the canulae ; hence the idea of a universal fitting.—J. E.

SAXINGER, G. (1933). Die intravenöse Kalzium-Therapie mit der Infusionsarmatur " Perleberg." **[Intravenous Calcium Therapy with the Perleberg Apparatus].**—*Deuts. tierärztl. Wschr.* **41.** 775. 2 figs.

This article describes an apparatus specially prepared by the Perleberger Impstoffwerk, Berlin, for intravenous calcium therapy. It consists of a bottle containing the sterile injection dose, fitted with a rubber disk and metal cap, the latter containing two holes through which a special tubular canula can be inserted for use with the attachment of a suitable rubber tube and injection needle.—J. E.

CHORLEY, C. W., & SWYNNERTON, C. F. M. (1933). **Traps for Tsetse-Flies of the " Crinoline " and " Ventilator " Forms.**—*Bull. Entomol. Res.* **24.** 315-318. 3 figs. [18 refs.]

In a preliminary note C. F. M. Swynnerton, Director of Tsetse Research, Tanganyika Territory, explains that the traps designed by Chorley have for their object the trapping of the *Glossina palpalis* and have not been properly tested against other species of tsetse. The choice of suitable sites for such traps demands expert knowledge, but if these are skilfully selected, the traps catch well. The mere tacking of a skirt on to a conical hoop trap as described by HOWARD (1912), the Hughen trap (1919), or the barrel trap designed by Burnett (1918) for the collection of house flies, constitutes a " Chorley trap " for tsetse flies.

Chorley describes his various forms of traps and illustrates them by figures and photographs. Some of these are " scented " by spraying or smearing upon them substances attractive to the fly, such as the fat of cormorants or crocodiles and extracts of animal glands. The " crinoline cavern trap " is used without scent and is lined with dark cloth, preferably black. It is laid on its side on the ground. The distant attraction consists in the conspicuous cavernous black mouth of the trap, probably suggesting a breeding or hiding place.

—LL. E. W. BEVAN.

MISCELLANEOUS.

MASON, E. (1933). **An Iodine Survey of New Zealand Live-Stock.**—*Trans. New Zealand Inst.* **63.** 373-388. 7 figs., 9 tables. [9 refs.]

This survey is being carried out on thyroid glands of sheep and the first part of the paper is devoted to a survey of other workers' results, the influence of sex, age, iodine feeding, and relation of soil to iodine content. From a study of the weight of glands and the percentage of iodine it has been shown that there is an inverse relationship which is negligible until the percentage of iodine has fallen below the critical value of 0·03 per cent. fresh weight. Enlargement of the gland has not been observed where the iodine is above the critical value.

Mention is made of an outbreak of congenital goitre in lambs reported by HOPKIRK and DAYUS (1930).

It is pointed out that potassium iodide is not stable under acid conditions and that iodized licks may be attacked and the iodide become decomposed under certain conditions.—C. S. M. HOPKIRK.

DRY, F. W. (1933). **The Pre-Natal Check in the Birthcoat of the New Zealand Romney Lamb.**—*New Zealand J. Sci. & Technol.* **14.** 353-358. 4 figs. [7 refs.]

A description is given of DUERDEN's classification of sickle fibres and curly-tip fibres in the wool of sheep of various breeds, which should be considered as " down" fibres.

The paper continues to describe a method of arraying sickle and curly-tip fibres to show that there is a definite transition between the two. Figures help to make intelligible the various " array " which the author has named " saddle ", " ravine ", " valley ", " plain " and " plateau ".

The effects of pre-natal check are listed as follows :—Shapely narrowing of the basal part of sickle end, fineness of the rest of the pre-natal region of sickle fibres, shedding of baby and infant sickle fibres, fineness of the tops of curly-tip fibres and checked curly-tip fibres. Halo hairs of regions where they are long show sub-apical thinning which is also an expression of check. The check has also been noted to extend to sweat glands.—C. S. M. HOPKIRK.

BAYNE-JONES, S. (1933). **A History of the National Research Council 1919-1933. VI. Division of Medical Sciences.**—*Science.* **78.** 26-29.

This is the sixth of a series of articles describing the activities of the U.S. National Research Council during the past 14 years. Of veterinary interest are the investigations on undulant fever in human beings and infectious abortion in swine and cattle. Numerous investigations have been made on the bacteriology and chemistry of the organisms in the brucella group, a collection of cultures has been maintained and a number of publications have been issued.—F. BULLOCK.

WARE, F. (1933). **A Description of the Imperial Institute of Veterinary Research, Muktesar, and its Sub-Station, The Imperial Veterinary Serum Institute, Izatnagar.** pp. 33. 6 plates, 2 tables, 1 map. [10 pp. refs.] Delhi : Manager of Publications. [4to] [2s.]

A description written by the present director to replace the previous one compiled by the late Col. HOLMES in 1913. The history of the institute, which was founded in 1890, is given and the lay-out of the estate is described with the aid of a ground plan and a number of photographs which are unfortunately very poorly reproduced.

The institute is situated some 7,500 feet above sea level in the foot-hills of the Himalayas in the Kumaun division of the United Provinces. The estate comprises 3,453 acres of which the station area covers over 500 acres.

In addition to the usual administrative and maintenance staffs, there are three research sections—the Pathology section, the Serology section and the Protozoology section. There are three British veterinary graduates and seven Indians holding veterinary or other degrees on the staff.

The main work of the institute is described and a résumé of the research work performed up to 1933 is given.

[The institute publishes an annual report. Previous reports have been abstracted in this *Bull.* **1.** 326, **2.** 626 and **4.** 399].—J. E.

OFFICIAL AND OTHER REPORTS.

COLONY AND PROTECTORATE OF KENYA. (1933). **Annual Report of the Chief Veterinary Research Officer for 1932.** [DAUBNEY, R.] *Ann. Rep. Dept. Agric. Kenya. 1932.* pp. 271-291. 4 tables. Nairobi : Govt. Printer. [8vo] [5s.]

For reasons of economy, the report appears in contracted form. Mr. J. WALKER, Chief Veterinary Research Officer, Kenya Colony, since 1918, left on retirement in October, 1932 and Mr. R. DAUBNEY, Assistant C.V.R.O. was appointed C.V.R.O. from 7th October, 1932. The post of Assistant C.V.R.O. remained unfilled during the rest of the year. Attention is drawn in the report to the great value of Mr. WALKER'S research work during his tenure of office and in particular to the practical benefits that have been derived by the livestock industry in East Africa from his work on pleuro-pneumonia, rinderpest, East Coast fever and horse-sickness.

On the routine side a summary is given of work relating to diagnosis and to the manufacture of laboratory products. 6,138 specimens were received for diagnosis and among other biological products the laboratory prepared 113,925 units (50 c.c.) of anti-rinderpest serum, 30,148 courses (30 c.c.) of anti-rinderpest vaccine and 80,195 doses of pleuro-pneumonia vaccine. A summary of research work forms the main part of the report.

RINDERPEST.—Experimental field inoculations by the vaccine plus virus method satisfactorily demonstrated the safety of the method. In an experiment with 1,200 head of susceptible cattle, virus, in the form of supernatant fluid from a centrifuged spleen extract, was injected 12 days after a single dose of 10 to 15 c.c. of inactivated vaccine. Nine of the inoculated animals developed clinical rinderpest but, since none of the remaining animals showed even the mildest clinical manifestations of the disease, it was thought that the nine reactors had escaped the preliminary vaccination. Random samples will be drawn from these 1,200 head for periodic testing of their immunity. Laboratory experience indicates that there is no need to use a vaccinating dose of virus and the field tests should furnish a reliable index of the durability of the immunity. The method has many advantages over the ordinary double-inoculation method, e.g. doses of vaccine can be so adjusted that clinical reactions are practically abolished. In consequence, any class of stock may be treated without fear of mortality, abortion, loss of milk and loss of condition. This method can be applied to the suppression of outbreaks of rinderpest in the pastoral reserves without the risk of raising too rapidly the herd susceptibility in these areas. This is a very desirable feature, since wholesale use of the vaccine alone has been limited by the fear that it might raise the herd susceptibility at a rate which would only intensify the difficulties of control in pastoral areas inhabited by nomadic tribes.

FOOT AND MOUTH DISEASE.—Advantage was taken of an outbreak of foot and mouth disease at the laboratory to make a brief investigation of strains of virus. The laboratory strain of virus in its earlier passages in guinea pigs gave complete protection against " A " virus and almost complete protection against " C "; conversely both " A " and " C " completely protected against the laboratory virus. During a series of rapid passages in guinea pigs the affinities with " C " gradually declined until by the 30th passage the strain cross-immunized completely with " A " but not at all with " C." The strain was therefore an " A " variant. Another virus collected in the Nakuru district behaved similarly. Two samples of virus received from Rhodesia for typing proved to be unusual, although in the earlier passages in guinea pigs one of them closely approached the " O " type. Owing to shortage of guinea pigs it was not possible to complete the investigation of these strains during the year.

Attempts to protect susceptible cattle against infection (inoculation or contact) by injections of convalescent or of polyvalent hyperimmune serum obtained from Riems failed, even when extremely large doses were employed. Vaccination of guinea pigs with formalinized vaccine gave moderately successful results.

NAIROBI SHEEP DISEASE.—Investigations into the possibility of transmission by ticks other than *Rhipicephalus appendiculatus* have been continued. In the control of outbreaks the efficacy of hand-dressing sheep with oily suspensions of tobacco extract has been repeatedly demonstrated.

HORSE-SICKNESS.—A histopathological study of material from experimental animals is being made and certain cytological changes have been encountered.

FOWL PARALYSIS.—This disease was diagnosed for the first time in Kenya. The subject was a bird imported from Great Britain.

RABIES.—In the preparation of material for diagnosis the rapid acetone method is used, followed by Goodpasture's or Mann's stain. Brain tissue preserved in 50 per cent. glycerin-saline is inoculated into rabbits whenever lesions are present in the brain without Negri bodies, or when human beings are known to have been bitten. Rabbits are inoculated by the temporal route, which is a much simpler method than frontal trephining.

A report of an investigation of Negri bodies by the micro-incineration method has been published in the scientific press.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—In one instance an attempt to transmit pleuro-pneumonia by the intratracheal inoculation of a small dose of filtered lymph was successful. The subject developed typical acute pleuro-pneumonia on the 18th day after inoculation and died on the 29th day. Pathognomonic lung lesions were found *post mortem* and the organism was cultivated from the thoracic exudate.

Infection has also been obtained by contact in one animal out of eight confined in a stable with six chronic cases of the disease. The lesion in this animal eventually developed into a typical lung sequestrum from which virus could not be recovered, although histologically the lesion was diagnostic. Further work on the aetiology of this disease is in hand and an application has been made to the Colonial Development Fund for financial assistance.

HAEMORRHAGIC SEPTICAEMIA IN CATTLE.—Attention is drawn to the infrequency with which the bacillus can be demonstrated in the blood or inflammatory exudate in numbers sufficient to justify a definite diagnosis. Mouse inoculation, however, provides an easy, rapid and most certain diagnostic method. Killed vaccines prepared from recently isolated cultures appear to give satisfactory results in the control of outbreaks.

EAST COAST FEVER.—Immune cattle, which were known to have been kept for prolonged periods in districts free from East Coast fever, were subjected to heavy infection in a testing camp, to determine whether immunity had been lost. Three animals out of eight showed slight febrile periods at some time between the 16th and 35th days, but parasites could not be demonstrated in blood or gland smears.

ENTOMOLOGY.—The work on tick distribution was continued and a survey of the Masai reserve completed. In this area *Amblyomma variegatum* is the predominant species, but *A. gemma* and *Rhipicephalus evertsi* are common and widely distributed. *R. simus* and *R. kochi* are frequently taken on domestic stock and *R. pulchellus* may be collected from most animals, species and individuals. *R. appendiculatus* is unevenly distributed in the Masai country.

A comprehensive report will shortly be published.

TSETSE FLIES.—At the moment there are indications that two important species, *Glossina pallidipes* and *G. fusca*, are actually spreading and considerable areas of rich pastures in native reserves have been rendered valueless ; the natives have been forced to find new grazing areas beyond the range of the flies.

—R. DAUBNEY.

MYSORE. (1933). **Administration Report of the Mysore Serum Institute for the Year 1932-33, with the Government Review thereon.** [ACHAR, S. D.] pp. 15. 14 tables. [fcp].

This institute was founded in 1927 for the production of anti-rinderpest serum and rinderpest virus for use in the state of Mysore, but in 1933 it was reorganized and enlarged for the additional production of biological preparations against anthrax, blackleg, haemorrhagic septicaemia, sheep pox and for general diagnostic work into the diseases of farm stock.

Work with rinderpest goat virus gave encouraging results and it is predicted that it will be adopted as a single-dose treatment for plains cattle.

The usual statistics for this type of institute are given, mostly in tabular form.—J. E.

BOOK REVIEWS.

HUDDLESON, I. F. (1934). **Brucella Infections in Animals and Man.** [Introduction by Ward Giltner]. pp. xiv+108. 24 figs., 18 plates, 7 tables. [188 refs.] New York: The Commonwealth Fund. London: H. Milford, Oxford University Press. [8vo] [$2.25].

This short monograph has been published with the object of bringing together the methods and fundamental information that might aid the laboratory worker in establishing a diagnosis of *Brucella* infection and in the study of disease due to *Brucella*.

The subject is dealt with in seven chapters and a bibliography of 188 references is given. There is also a useful index. The first chapter deals concisely with the genus *Brucella* and the cultural characteristics of the three species. Other chapters deal with methods of isolating the organisms from body fluids and tissues, the pathology of infection in the guinea pig, the cow and man, serological, allergic and opsono-cytophagic methods of diagnosis. In the final chapter methods of differentiating the species are given.

The methods described are those adopted by the laboratory at the Michigan State College after a long and intensive experience. It is not claimed that other equally satisfactory laboratory methods do not exist, but that to include them all would serve no useful purpose and might overload the manual and lead to confusion.

Frequently throughout the book quite long quotations are taken from the literature as well as illustrations, the sources of which are always clearly indicated. In spite of this, it is doubtful if the field could have been covered more thoroughly and dealt with more concisely than is the case. Table V on p. 60 gives a proposed system for the diagnosis of undulant fever in man according to the results of agglutination, allergic and opsono-cytophagic tests. According to this scheme a diagnosis of *Brucella* infection can be made in the absence of agglutination when the allergic skin test is positive and up to 40 per cent. of the phagocytes show marked ingestion of organisms. Further experience is probably necessary before the claims of this scheme can be fully justified.

The chapter dealing with the differentiation of the three species will be of special interest to bacteriologists. The author lays great stress on the importance of exact pH adjustment of the culture medium in his method of differentiation by the bacteriostatic action of dyes.

The publishers are to be congratulated on producing a book of handy size, printed and bound in such a manner as to leave nothing to be desired. The illustrations are all very clear and serve to add to the value of the text. This monograph

can be recommended to clinicians and laboratory workers in both the veterinary and medical fields.—L. B. BULL.

PFEIFFER, W. [Prof. of Veterinary Surgery at Giessen University] & WESTHUES, N. [Prof. of Veterinary Surgery at Munich University]. (1934). Operationskursus für Tierärzte und Studierende. **[Operation Course for Veterinary Surgeons and Students].** pp. 189. 98 figs. Berlin : R. Schoetz. 9th Edit. [8vo] [RM 5.80].

An excellent book of the compendium class, designed to offer instruction on standard veterinary operations for final year students. It deals with all the common domestic mammals and is arranged in sections according to regional anatomy. It contains in addition a chapter on the various forms of anaesthesia required for the operations described.

The matter is up to date and methods of regional anaesthesia, which have been given so much attention in recent years by the German veterinary colleges, are described and many are illustrated.

Nearly all the operations the surgeon should know how to perform are described : it is, however, surprising that the operations for poll-evil and fistulous withers are not dealt with ; also of common operations on cattle there is no mention of rumenotomy nor of dehorning.

The choice of anaesthetics differs somewhat from the general practice in England, chloral hydrate figuring more prominently for the horse, alcohol (*per os*) for ruminants and pernocton for dogs and cats.

The book is very cheap at less than RM 6. and every veterinary surgeon ought to possess a copy.

The printing of the text and illustrations is very clear.—J. E.

HALER, D. H. [M.B., B.S., Pathologist, Infants' Hospital and Battersea General Hospital, London]. (1933). **Aids to Pathological Technique.** pp. x+187. 18 figs., 9 tables. London : Baillière, Tindall & Cox. [8vo] [3s. 6d.]

An addition to the publishers' popular " Students' Aids Series " and written to give a concise guide to pathological technique as applied to bacteriology, haematology, cytology and parasitology, biochemical methods and the preparation of culture media, stains, etc. The author has " endeavoured to given one example of each method found most valuable," and does not describe alternative methods, which would make the book too bulky, besides overtaxing the student still more than necessary.

Much of the matter is of direct interest to veterinarians, and the book should therefore become popular with them, both before and after graduation.—J. E.

DORNER, W. [Bacteriologist at Milk Research Institute, Liebefeld, Bern]. (1933). Methoden zur Untersuchung von Bakterienkulturen mit einem Schema zur Beschreibung von Bakterien. **[German Translation of " Manual of Pure Culture Study of Bacteria " including a Chart for the Description of Bacteria].** pp. v+148. 1 fig., 12 tables. [130 refs.] Hanover : M. & H. Schafer. [8vo] [RM.6].

The book at hand is a German translation of the 1932 edition of the well-known " Manual of Pure Culture Study of Bacteria " in which are collected the reports of the special committees of the American Society of Bacteriologists set up from time to time in connection with the classification of bacteria and the methods required thereto.

As in the English editions, the material is arranged under the following

headings :—media, staining methods, description of bacteria, including the use of the chart devised for the purpose, anaerobes, the determination of pathogenicity, serological methods and determination of pH concentration.

—A. W. STABLEFORTH.

LAROCHE, G. [Professeur agrégé à la Faculté de Médecine de Paris]. (1933). Opothérapie endocrinienne. [**Endocrine Opotherapy**]. pp. 396. 19 figs. [55 refs.] Paris : Masson et Cie. 2nd Edit. [8vo] [Fr. 48].

The first edition of this book was published in 1925 and so great an advance in endocrinology has been made since that date that the author has had to write a new book. This is a long and comprehensive treatise on the physiological, clinical and therapeutical aspects of endocrinology in the human subject. The various endocrine organs are discussed in turn, full space being given to the diagnosis of endocrine dysfunction and the indications for glandular therapy. The methods of preparing extracts are also described.

This book should be useful to the veterinarian, chiefly in the field of comparative physiology and, to a certain extent, in the field of therapeutics, in so far as the corresponding syndromes are recognized in animals. Due allowance must, however, be made for the variations in endocrine functions existing between man and the lower animals.

Both paper and printing are of a high quality.—J. E.

RAWLING, S. O. [D.Sc., F.I.C., F.R.P.S.] (1933). **Infra-Red Photography.** pp. x+57. 17 text figs., 16 figs. on 10 plates, 2 plates, 4 tables, 4 appendixes. London : Blackie & Son, Ltd. [8vo] [3s. 6d.]

The author explains the principles of infra-red photography and gives examples of its practical application. Ordinary photographic plates are only sensitive to the lower part of the spectrum—from violet to green ; orthochromatic and panchromatic material extends the sensitivity to orange and red, and infra-red plates, treated with one of numerous red dyes, are sensitive to infra-red rays, which have greater penetrative power than visible rays.

Thus infra-red photography is valuable for long distance work in a hazy atmosphere, for the examination of manuscripts, materials, etc., and, in medical science, for the diagnosis of diseases of the skin or subcutis. It has also recently been applied with success to histological work, particularly for the examination of the nervous system. The text matter is easily grasped and the illustrations are very useful.—J. E.